AVIATION WEEK
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AUGUST 9, 1948

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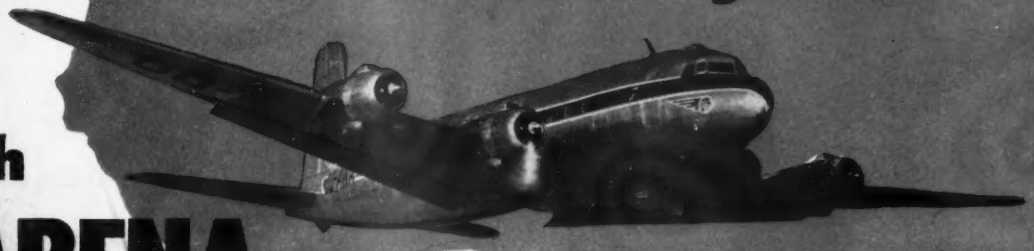

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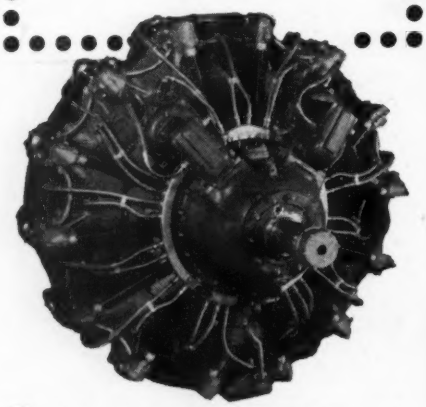

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AVIATION WEEK

Vol. 49, No. 6 — August 9, 1948

Sidelights	7	New Products	32
News Digest	8	Financial	33
Headline News	11	Sales & Service	35
Aviation Calendar	16	Briefing for Dealers	37
Industry Observer	16	Transport	38
Engineering-Production	17	Editorial	50

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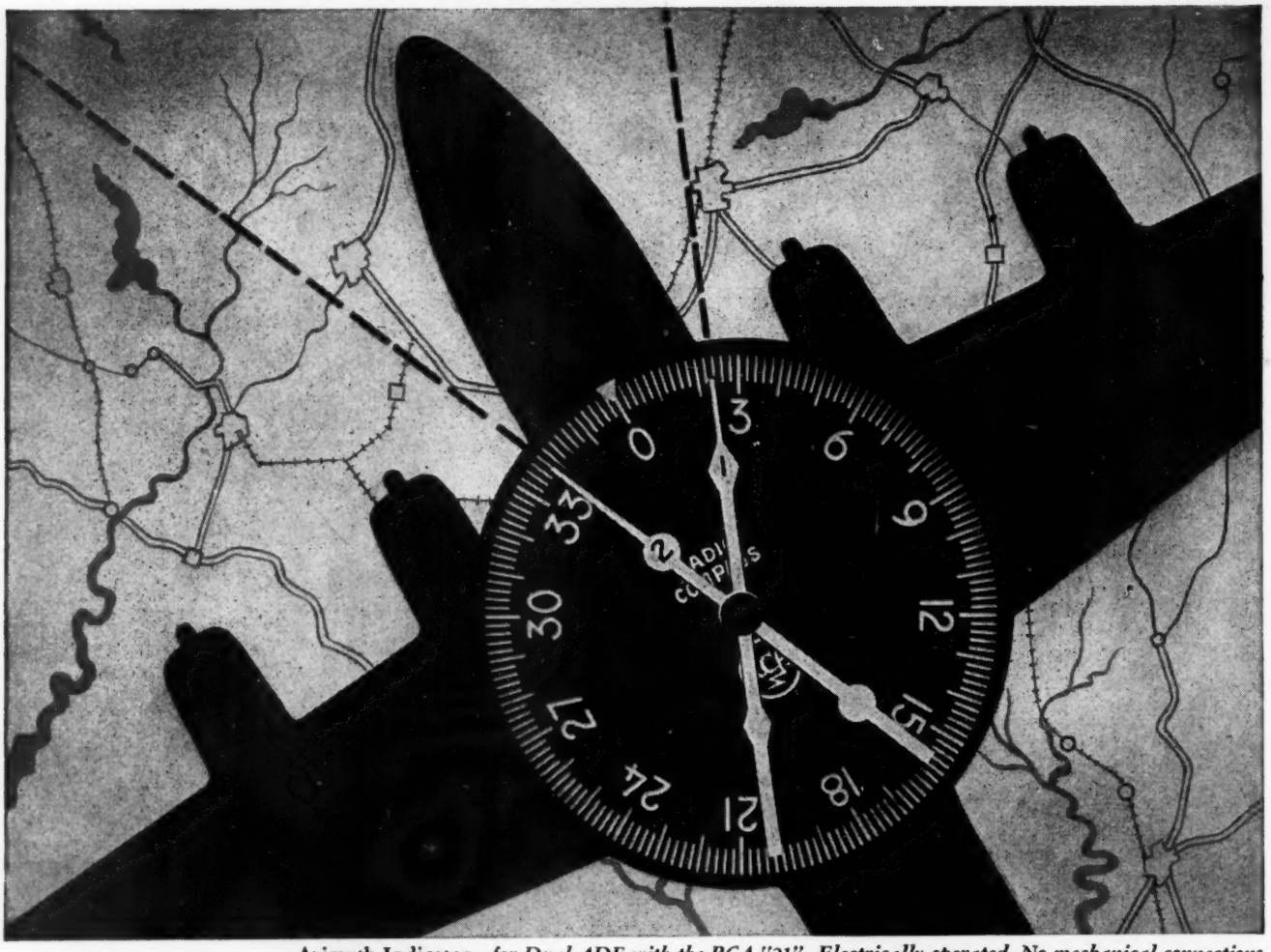

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NEWS SIDELIGHTS

Refueling Future

Only the surface of the Air Force's aerial refueling plans has been scratched. Air Materiel Command is sending Captain David Samiran, who has been developing his well-known "single-point" refueling system at Wright-Patterson Field for seven years, and a crew is flying a specially-equipped Boeing B-29 around the country to demonstrate the new system to all major airframe manufacturers.

Purpose of the classroom demonstration, complete with models, is to acquaint contractor personnel with the details of the system so that their future aircraft designs submitted in answer to circular proposals will incorporate the single-point aerial refueling system. Air Force has made definite plans to provide all future aircraft with single-point refueling systems both to speed ground time spent in refueling and to permit aerial refueling.

Footnote on Berlin

As the Berlin airlift climbed steadily to a record of 3154 tons daily last week, RAF and USAF transport services were hard pressed to scrape up the additional strength required to meet the 4500-ton goal recently set by Gen. Lucius Clay.

Military Air Transport Service was forced to scuttle its de luxe transcontinental nonstop service and its U route serving domestic Naval air stations to put an extra squadron of C-54s into the Berlin transport pool.

Meanwhile Navy is unhappy over the role assigned its crews in the MATS effort and the studied indifference to using the Mars squadron in Europe. Navy crews and planes taken off the transcontinental and U routes have been put on the north-Atlantic route flying only as far as Frankfurt while USAF crews from the Atlantic division are on the Frankfurt-Berlin run.

Admirals Price and Radford announced that the Mars squadron was ready to operate into Berlin if the Joint Chiefs of Staff requested. Nothing but silence has come from the JCS and Air Force.

Martin Urges Caution

Glenn L. Martin flashed an amber light on the Congressional Aviation Policy Board's prototype development bill, sponsored in the House by California's GOP Rep. Carl Hinshaw, and in the Senate by Maine's GOP Sen. Owen Brewster.

Washington Chaff

► Although all is calm on the surface the feud between Air Force Secretary Symington and Defense Secretary Forrestal is still smouldering bitterly.

► Navy is mending its fences with the Republican administration anticipated next year. Admiral Louis Denfeld, chief of Naval operations, recently conferred with vice presidential nominee Earl Warren at Sacramento, Calif.

► Hottest spot in Washington is the new legislative job in the National Military Establishment aimed at ironing out inter-service rows before they hit Congress. Maj. Gen. Wilton Persons of the Army got the job with three assistants: Maj. Gen. James D. McIntyre, one of the Air Force's few non-pilot generals; Brig. Gen. Miles Reber of the Army and Capt. Ira H. Nunn of the Navy. Persons is a longtime campaigner for making unification work.

► Appointment of mustachioed Maj. Gen. Leon Johnson to command Boeing B-29s in England underscores the fact that these "training missions" are ready for business. Johnson, like Lieut. Gen. Curtis LeMay now commanding the USAF in Europe, is noted for his combat leadership. Johnson won the Congressional Medal of Honor in the first Ploesti raid and later was a heavy bomber commander in combat over Germany.

Martin's caution signal came after the measure, with bandwagon support of manufacturing and airline interests and government agencies, had sped through the House and appeared set for quick Senate approval in the special session. Martin told AVIATION WEEK he wanted the "full import" of the measure on the manufacturing and transport industries carefully scrutinized. Even the bill's sponsors concede it is likely to drastically cut down competitive effort, concentrate commercial plane development in the few firms selected for government-financed projects.

Martin termed the bill "poorly, and hastily drafted". He said it "does not begin to meet the needs either of the aviation industry or of the country for research. Futhermore, it neither treats the manufacturing industry correctly—nor fairly." After Martin's signal there was evidence of some cooling in the industry to immediate enactment of the proposal.

Aircraft Industries Association's representative, Bert Goss, reported sentiment among manufacturers to let it go over until next year. This would provide time for working out perfecting changes and resolving intra-industry differences—if possible. *(For the complete story, see page 38.)*

Top Secret Report

Stanford Research Institute's top secret report on the expansibility of the aircraft industry has been delivered to Defense Secretary Forrestal. The Stanford University study group was headed by Weldon B. Gibson who was formerly director of materiel requirements for the Army Air Forces during World War II.

The Stanford study also included an evaluation of the Air Force 70-Group program on the aircraft industry and a special study of the entire aircraft engine field.

Brazilian Ties

Look for a steady tightening of aviation ties between the United States and Brazil.

Signing of a U. S.-Brazilian agreement to send U. S. Air Force officers to Rio to help set up a Brazilian War College parallels a similar unpublicized development in civil aviation. Both military and civil aviation of Brazil will be patterned along U. S. standards and should provide a good long term export market for aviation equipment of all types.

VA Chiefs Grilled

Top Veterans' Administration officials were called back before a House Appropriations Committee executive session on GI flight training last week. The sessions were closed but it was understood that the call was in response to loud protests on the way the VA has stymied flight training contracts since Congress approved vocational flight training for veterans. A better deal in the regional VA offices for veterans wanting flight training, may be the net result of the session. Reports from the midwest indicate that not a single veteran has been approved for flight training by regional VA officials since the July 1 deadline.

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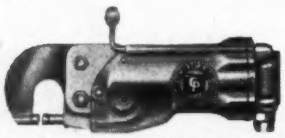

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NEWS DIGEST

DOMESTIC

Sen. Glen Taylor (Prog., Ida.) has introduced a resolution calling for termination of all government contracts with Boeing Airplane Co., until the firm settles its dispute with the International Association of Machinists.

U. S. Court of Appeals has upheld a CAB decision of last December rejecting TWA's claim for $11,157,000 in retroactive mail pay which the carrier sought to cover losses between Jan. 1, 1946, and Mar. 14, 1947.

The Army has announced a contract with Johns Hopkins University, Baltimore, for establishment of a general research office to develop guided missiles and other new weapons.

FINANCIAL

Monsanto Chemical Co. and its domestic subsidiaries reported net income of $7,926,759 for the six months ended July 1. The net equals $1.73 a share and compares with $9,275,133 or $2.23 a share in the first half of 1947. Net sales rose from $71,085,736 to $78,739,148.

Cleveland Graphite Bronze Co. reports sales of $13,497,171 and net profit of $1,089,888 for the first half of 1948. Profit on the common shares is $1.61 after preferred dividends. In the previous six months' period, sales were $12,384,158 and profits $823,441, or $1.17 per common share. Two 40-cent dividends were paid on common stock in the first half of 1948.

Canadair Ltd. has a backlog of about $20 million following receipt of the British order for 22 DC-4Ms, its parent Electric Boat Co. reports. In first six months of this year, Canadair sales totaled $29 million.

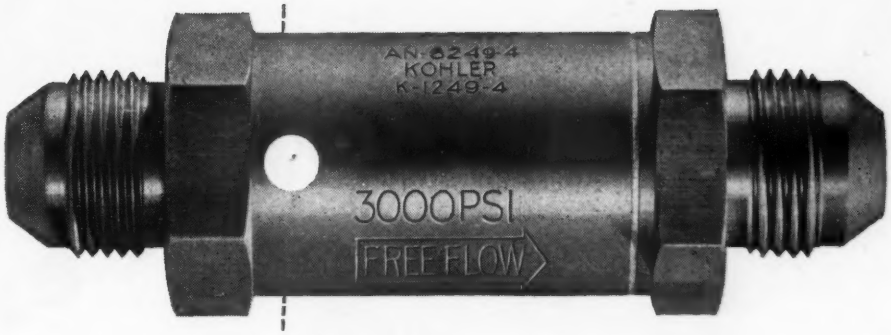
FOREIGN

Air France grounded its six-engine Latecoere flying boats after one of the 79-ton craft carrying 52 persons disappeared on a flight from Martinique, French West Indies, to Port Etienne, French West Africa.

U. S. and Mexico have resumed negotiations on a bilateral air transport agreement at Mexico City. Failure to complete such a pact has prevented Braniff Airways, Western Air Lines and Eastern Air Lines from activating new routes to Mexico which were certificated in CAB's Latin American decision in the spring of 1946.

Australian Cabinet has decided that 10 Australian Air Force C-47s with crews will be made available to assist in the air lift to Berlin if Great Britain requests such assistance.

KOHLER QUALITY



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THE quality workmanship and reliability associated with the name "Kohler" have been demonstrated anew by the acceptance of Kohler precision parts by leading aircraft manufacturers and the Army and Navy Air Forces. The stainless steel Hydraulic Cone Check Valve shown bears the Army-Navy "yellow dot" — proof that it has passed the official tests required for qualification under combat conditions. All Kohler valves and fittings for aircraft are made under the "approved" rating of the Army Air Forces.

Prompt service is assured by the fact that Kohler maintains within one plant, full facilities for die-casting brass, aluminum or white metal, sand-casting, forging, machining, plating and anodyzing. The Kohler line includes many types and sizes of precision parts. Where special requirements exist, Kohler engineers will welcome the opportunity to develop valves or fittings specifically designed to meet them. Kohler quality is a 75-year-old tradition. Send for copy of Catalog K., Kohler Co., Kohler, Wisconsin.

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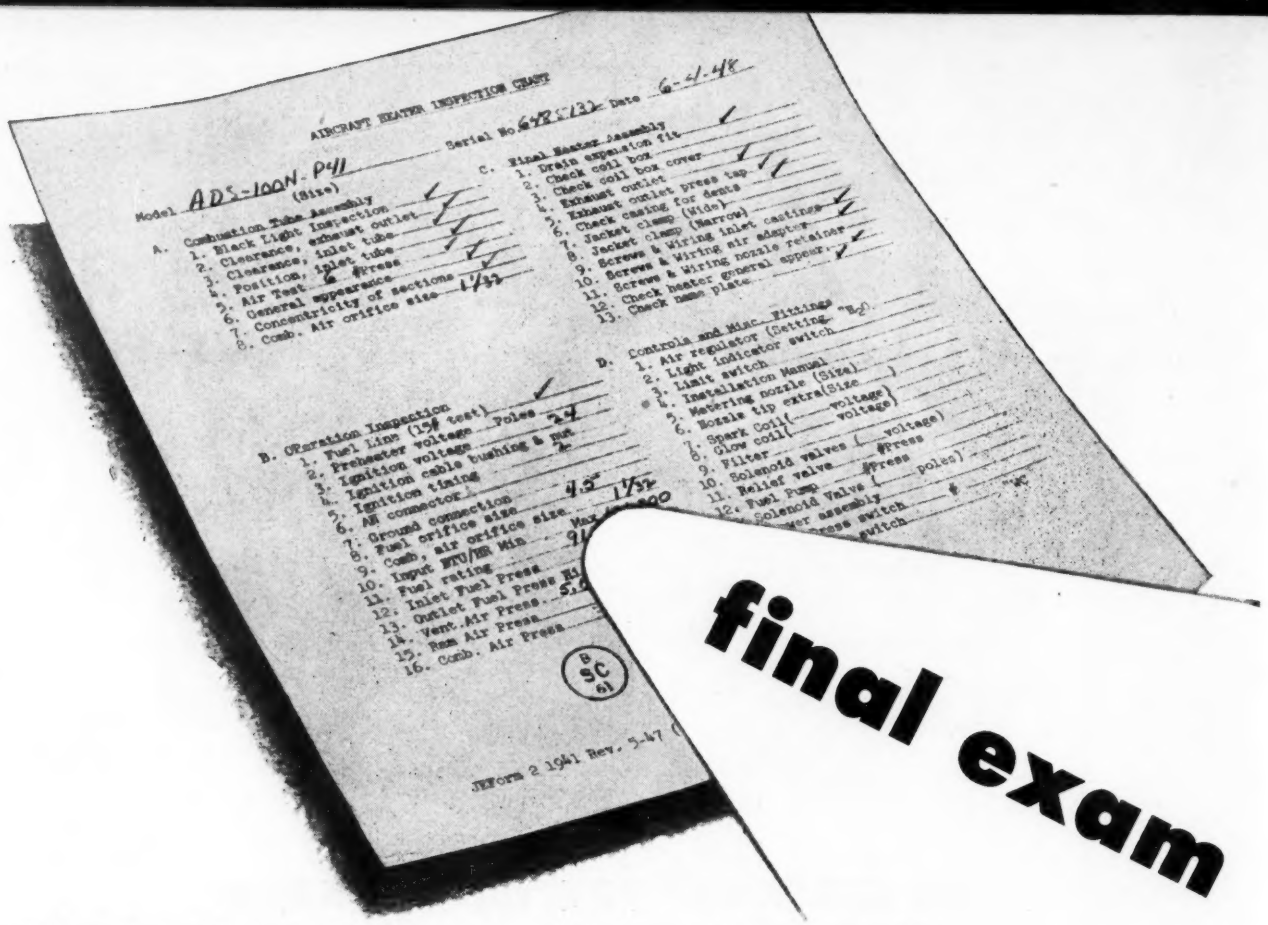

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Every single Janitrol aircraft heater virtually goes to flying school, and must pass over 200 tests, before it goes out into the cold world. It's a tough course: 67 of the tests are listed on the above form; 27 of these are operational, done on benches where the heaters, you might say, are "Checked out" under conditions that come mighty close to and in most cases exceed actual operating conditions . . . Is it any wonder, then, that you'll find Janitrol heaters serving on most airlines, on such aircraft as the DC-3, DC-4, DC-4M1, DC-4M2, and DC-6—Constellations, Models 049, 649, and 749—F7F, F4U5—P-51—TBM—SB2C—A-26—C-46, C-54, C-74, and most recently, on the C-119 Packet. Any wonder Janitrol engineering representatives are consulted so frequently on standard and special heating problems for military and commercial aircraft?

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Vol. 49, No. 6

AVIATION WEEK

August 9, 1948

Two Boards to Direct Renegotiation Act

Five-man teams of USAF and Navy will be subject to review by three-man board.

Pattern for administering the Renegotiation Act of 1948 began to emerge in Washington last week.

Aircraft manufacturers and subcontractors will deal principally with two five-man renegotiation boards, one for the Air Force and the other for the Navy. Each board will handle contracts dealing with its particular service except where joint procurement policies are in effect. The Army will also have a board but it will be of little concern to the aircraft industry. Personnel for these three boards has not yet been picked.

▶ **Review Board**—Chairmen of the three service renegotiation boards will serve as a top level military renegotiation policy and review board functioning directly under Defense Secretary Forrestal and wielding all his authority on renegotiation.

Plan is for the three service boards to handle all renegotiation dealings with contractors, with the policy and review board establishing basic policy and sitting in review on appeals by contractors from service board decisions. Review board decisions can be appealed to Federal tax courts.

The policy and review board will also assign contractors to one of the three service boards for renegotiation proceedings and determine service jurisdiction where joint procurement policies prevail.

The policy and review board will also have authority to exempt contractors and subcontractors from some or all provisions of the act and to audit the books and records of any contractor subject to the act. This board will submit semi-annual reports on its activities beginning next January.

▶ **Advisory Group**—As the Renegotiation Act now stands, all contracts and subcontracts of more than $1000 are subject to renegotiation if a firm's annual gross business under these contracts is more than $100,000 for a fiscal year. All military aircraft procurement contracts and subcontracts agreed to after May 21, 1948, are included in the act.

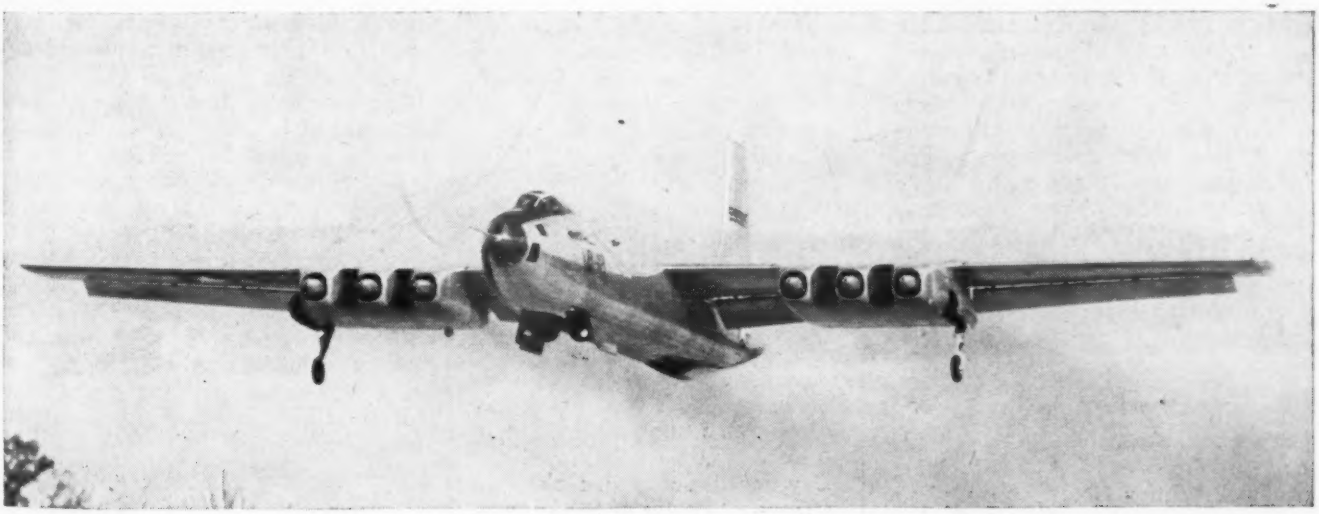
A special committee consisting of Undersecretaries of the Air Force (Arthur Barrows), the Navy (John Kenney) and Army (Gordon Gray) has been preparing tentative regulations governing renegotiation procedures for Defense Secretary Forrestal. Final regulations will not be issued for some time. They will be published eventually in the Federal Register and be available from the Superintendent of Documents, Washington 25, D. C.

▶ **Revised Policy** – Generally speaking, the rules and regulations set out in the Renegotiation Act of 1944, corrected to apply to the present economic trends, will be used in administration of the new act by the military.

In determining what portion of profits on a renegotiable contract should be refunded, the military believes the repayment should not cut gross receipts below the $100,000 floor. In addition, repayments under $10,000 are not considered worthwhile.

Under the proposed regulations all makers of military aircraft and any component thereof; suppliers of plane and parts manufacturers; and makers of machinery used in making an end product used in aircraft or component manufacture are all subject to renegotiation. Contractors reports will be required annually within six months after the end of each fiscal year.

▶ **Proposed Exemptions** – Exemptions are proposed for all contracts prior to May 21, 1948; tax-exempt charitable



XB-48 ON DELIVERY FLIGHT

New view of the Martin XB-48 shows the six-jet bomber in takeoff from Martin Airport, Baltimore, Md., on its delivery flight to the Air Force. With first phase tests completed by Martin test pilots, craft is now at Wright-Patterson Field, Ohio, for the second phase.

religious and government institutions; and subcontracts under a prime or other subcontract that is exempt. In addition, the Secretaries of the Army, Navy and Air Force and the Policy and Review Board have authority to exempt individual contractors from provisions of the act.

In detailing how machinery and allied-product manufacturers come under the proposed regulations, procurement experts explain that a contract or subcontract for a machine or material is renegotiable if that item is used:

- To produce or otherwise operate directly, on an end product or an article included in an end product, by chemical, physical or mechanical methods—such as shaping, cutting, constructing, combining, refining, assembling, testing, inspecting, or in the case of the end product, packaging.

This includes not only such machinery as rolling mills and machine tools, but also guages and other measuring instruments, torches and chemicals or other materials consumed in the course of the manufacturer's burning process.

- To transport within the contractor's plant an end product or article incorporated in it, or other articles used in connection with production, including such items as tractors, trucks, and traveling cranes.
- In connection with the repair, maintenance, equipping, or operation of the contractor's plant or machinery or equipment used in production, including spare parts, auxiliary tools, abrasives, wrenches, screwdrivers, hand tools, or equipment located in the tool room of a contractor's plant, and special equipment used for the manufacture, preparation or maintenance of tools, dies, jigs, fixtures, equipment or various machinery.

▶**Excluded Items** — The military intends to exclude from renegotiation the sale of articles which contribute only indirectly to the actual manufacturing process. These items would include products used for general plant maintenance, fuel, power equipment, general office equipment and supplies, safety equipment, and clothing.

It does not intend to exclude any articles sold to a contractor when the items are ultimately to be resold to the government either as end products or components.

Chinese Suspend

Two major Chinese Airlines, Central Air Transport Corp. and China National Aviation Corp., suspended all passenger reservations from Shanghai last month, blaming high cost of operation and particularly the price of gasoline.

Piston Engine Boosted to 4000 Hp.

Both Wright and Pratt & Whitney producing new-type powerplants promising startling low fuel consumption.

A new future for the reciprocating engine, evolved through a mating with the gas turbine, is germinating in a series of new long range bombers and patrol planes.

The compound engine, a conventional reciprocating engine with geared gas turbine, has passed its preliminary ground and flight tests and is already in limited quantity production by Wright Aeronautical Corp. and Pratt & Whitney Aircraft division, United Aircraft Corp.

First important production installation of the compound engine will be the Boeing B-50C powered by four Pratt & Whitney R-4360-VDT engines developing 4000 hp. for takeoff and rated maximum at 3880 hp. at 30,000 ft.

Although this additional power will increase the top speed of the B-50C to 460 mph., a 15 percent improvement, the major strategic value of the new installation lies in greatly reduced fuel consumption which will stretch the B-50C's range to the vicinity of 10,000 miles. This is a distance formerly the exclusive capability of the so-called "super" bombers.

Exact range capabilities await extensive flight tests of the ultimate Boeing installation but basic engine tests have proved the practicability of a 20 percent consumption reduction over the standard R-4360 engine.

▶**Navy Engine**—Navy's compound engine application will be the Lockheed XP2V-4, an improved version of the distance record-holding "Truculent Turtle", which already has flown 11,236 miles with standard reciprocating engines. The new Neptune version will be powered by two Wright Cyclone-18 compound engines developing 3350 hp. for takeoff and a rated 3200 hp. for 30,000 ft. operation.

Numerous studies have been completed and plans are well advanced for other installations including Northrop B-35 (P&W VDT), Lockheed XR-60 (Wright 18), and North American XAJ-2 (Wright 18). Studies have also been made of new bomber and search aircraft proposals designed specifically for compound engine installations in aircraft.

▶**Reclaim Energy**—Compounding a gas turbine with a reciprocating engine grew out of the need for reclaiming some of the energy wasted in the Otto cycle reciprocating engine. As high as 65 percent of the fuel energy supplied to the reciprocating engine is lost in the form of unavailable heat.

Although only a small portion of this loss can be recaptured by compounding, the gains in engine power and reduced fuel consumption are clear "profit" in the energy balance of the machine. About 50 percent of the total fuel energy is wasted through the engine exhaust and about 25 percent of this can be converted to useful work through compounding.

The idea for the compound engine was a natural development of the turbosupercharger, which uses only a small portion of the available energy in the engine exhaust stream to compress air for the carburetor. The rest of this energy is dumped overboard through the waste gate. Engineers early saw the practical benefits of gearing the turbosupercharger back into the engine crankshaft where this waste energy would be utilized to "drive" the reciprocating engine.

▶**Five Projects**—During the war, five engine manufacturers undertook Air Force and Navy development contracts and the first successful compound engine was the Allison V-1710-127, a development of the standard Allison liquid-cooled design. This particular project was abandoned due to pressure on the Allison staff for turbojet and turboprop engineering and production. The Wright and Pratt & Whitney projects were continued to their present production stage.

The National Advisory Committee for Aeronautics was called into the program shortly after V-J Day to provide fundamental data on engine compounding. This program has been steadily expanded at the NACA Flight Propulsion Research Laboratory, Cleveland, Ohio, until it is now a major research project. It has been largely on the basis of NACA studies that the full promise of the compound engine has been revealed and Air Force and

Sonic Review

Fast fiying planes have brought a host of new considerations to the attention of the aircraft engineer and aerodynamicist. Latest basic knowledge on this subject is wrapped up in one clear-cut review—a "Primer of Sonic Aerodynamics"—in the next issue of AVIATION WEEK.

Navy development projects encouraged.

►**Low Fuel Consumption Seen**—These NACA studies indicate that a specific fuel consumption as low as 0.15 lb. fuel per hp. per hr. can be obtained at sea level at cruise power at an airplane speed of 100 mph. This means that even the huge Pratt & Whitney Wasp Major engine would use only 30 gal. of fuel per hr., compared to the more than 100 gal. per hr. it presently uses at cruise speed.

This reduced fuel consumption would literally more than triple the range of an aircraft, or reduce its cost-per-mile to less than one-third. At a cruising speed of 400 mph., used by the B-50C, the fuel consumption of the compound engine is about 0.40 lb. per hp. per hr., a 20 percent reduction permitting an equivalent range increase.

Development problems of the compound engine have proved complex and costly and it is certain that the engine could not have been developed without military cognizance of the projects. The same gear-reduction and gas turbine problems are inherent in the compound engine as are present in the turboprop engine, since the turbine speed must be geared down to engine speed, turbine inlet temperature held to limits demanded by materials, and high-efficiency ducting developed.

►**Major Problems**—One of the major problems has been the division of work between the engine and the turbine, the ultimate in efficiency being obtained when all the work is done by the turbine with the reciprocating engine acting as a compressor and combustion chamber for the turbine, as in the turboprop and turbojet engine. Present compound engines utilize about 75-85 percent turbine power and 15-25 percent engine power.

Present compound engines are compromise developments consisting essentially of an additional unit (three turbines on the Wright engine, one on the Pratt & Whitney engine) to a standard reciprocating engine. These engines operate at a brake mean effective pressure of from 135 to 220 lb. per sq. in. and compression ratios of 6-7.00. The compound engine must operate at considerably higher BMEP to attain efficiency. This means that considerably stronger pistons, cylinders, bearings and crankshafts must be developed before the full potentialities of the design can be realized.

One of the major advantages of the compound engine is that it can operate efficiently at comparatively low pressure ratios (inlet manifold pressure to turbine inlet pressure), a range of 0.95 to 1.2 being used in present designs. Increasing this ratio increases turbine power but decreases engine power. However, maximum fuel economy is obtained at a higher pressure ratio value than that at which maximum power is obtained so that compromise ratio is needed for efficient performance.

The compound engine operates most efficiently at comparatively low altitudes and speeds, achieving its lowest fuel economy at 30,000 ft. at airplanes speed of 200 mph. Higher altitude and speed increases its fuel consumption and lowers its power output. The engine has a heavier installed weight than a conventional engine which means that its operation over the first 2-300 miles is costly. Above the 1500-mile range the compound engine may demonstrate the lowest fuel consumption of any internal combustion machine yet built.

CAB Decides In Favor of C&S

Chicago & Southern Air Lines has its Kansas City, Mo.-Memphis, Tenn., route back again.

By a three-to-two decision, CAB has reaffirmed its decision of last September granting the link to C&S and has withdrawn an order which temporarily prohibited the carrier from activating the new service.

In a dissenting opinion, CAB Chairman Joseph J. O'Connell, Jr., and Member Josh Lee said they believe Mid-Continent Airlines rather than Chicago & Southern should be awarded the Kansas City-Memphis route.

Concurrently with the supplemental opinion, CAB's majority instituted an investigation on the desirability of establishing equipment interchanges to provide single-plane service through the St. Louis gateway between cities on Mid-Continent's system and southeastern cities served by Eastern Air Lines; or through the Memphis gateway from cities on MCA and C&S routes to southeastern cities on Delta's or Eastern's routes. The Board also plans to consider establishment of through, single-plane service between points on Braniff's Denver-Memphis route and cities on Eastern's link from Memphis to the Southeast or Delta's system southeast of Memphis.

FIRST TURBOJET AIRLINER AT END OF RECORD FLIGHT

Britain's Nene-powered Viking transport lands at London airport after its flight to Paris and return. The world's first jet-powered transport flew the 213-mile distance in 34 min., 7 sec. eastbound and 36½ min. on the return trip. Previous best time for the route was 41 min. The Viking is manufactured by Vickers-Armstrong and is normally a 24-27 passenger plane.

The crowd and the Air Force planes—in this instance C-82 Packets—celebrated the opening of New York International Airport.

USAF Flexes Muscle at Idlewild

Exposition opening world's largest civil airport is dominated by military, with few industry exhibits.

From an eight-day, $200 million-plus air exposition at New York City's new International Airport the significant fact emerges that the U. S. Air Force still has the planning brains and piloting skill to put a horde of airplanes over a given place at a given time.

Billed as the world's greatest air show, the International Air Exposition that began with the dedication by President Truman of the airport at Idlewild was all of that—in the air. On the ground, the static exhibits—conceived to give the public an idea of who makes the planes and what they build—fell shy of the mark.

The first day's events, featuring massed strength of the Air Force (some 900 planes) and of the Navy (200 planes), larded with aerobatics of Al Williams, Navy, Royal Air Force and Royal Navy planes, set the pattern. On this and succeeding days, the crowd turned out in numbers that might near a million to see the military and naval planes, before the week was out.

▶**Civil Side Subdued** — This brought forth the comment from more than one aviation observer that it was peculiar that the opening of the world's largest civil airport (4900 acres) had to be celebrated by colorful military flying somewhat on the hair-raising side. The civil motif throughout the eight days was subdued.

No exclusively airframe manufacturer had a display at the show, although Curtiss-Wright and United Aircraft both had booths. No airline took space. At the one civil transport event, a luncheon adressed by Sir William Hildred, director-general of the International Air Transport Association, no airline president was present.

Lack of airline participation was attributed to the bitter controversy between the certificated carriers and the Port of New York Authority over rates and leases at Authority-operated airports. A Braniff Airways DC-6 carrying White House staff members and newspaper correspondents was the first domestic airline transport to land at Idlewild, but Braniff, not serving New York, is not involved in the argument with the Authority.

▶**Air Force Planning**—The mass flight of Air Force planes on the first day could indicate that the USAF, while still deficient in numbers, has not lost its ability to master a complex operational assignment. The planes came from Maine, Florida, South Dakota, Alabama, Michigan and Texas, some flying directly from their home bases.

The first planes were due over the field at 3 p.m. At 2:58, before President Truman had finished his dedicatory address, the first group of F-80s sped across the field from the south.

▶**Navy Show**—The Air Force planes streaming across the sky were impressive by their very numbers. The Navy, however, had the crowd-appeal show, with carrier planes simulating dive bombing and low-level strafing and torpedo attacks. The two shows, illustrated the difference in tactics between Air Force and Navy operation.

The Navy continued its spectacular flying throughout the week, with its special aerobatic team, the "Blue Angels," flying Grumman F8Fs. In addition, the Grumman F9F Panther was shown publicly for the first time, making a pass each way at the field and appearing, at least, to be the fastest thing shown all week.

▶**On the Ground**—Exhibitors with displays open to the public included American Telephone and Telegraph Co., Allison division of General Motors Corp., American Airmotive, Inc., General Electric Co., International Telephone and Telegraph Co., Curtiss-Wright Corp., United Aircraft Corp., Scintilla Magneto division of Bendix Aviation Corp., Durham Aircraft Service, Stratos Corp., Cherry Rivet Co., Gulf Oil Co., Walter Truck Co., Westinghouse Electric Corp., Brecher Bros., Portland Cement Assoc., United States Steel Corp., National Air Council and Greer Hydraulic Co.

Aeronautical Board Duties to Munitions

Principal functions of the Joint Army-Navy Aeronautical Board have been transferred by Secretary of Defense James Vincent Forrestal to the Aircraft Committee of the Munitions Board.

The transfer was effective Aug. 1, in an order dissolving the 32-year-old Aeronautical Board and assigning the remainder of its duties to the Research and Development Board. The Aeronautical Board was set up by law to coordinate all problems affecting the development of military aviation. Under the National Security Act of 1947, its functions were in a large measure duplicated by duties assigned by the act to the Munitions and Research and Development Boards.

▶**New Members**—Aircraft Committee of the Munitions Board was organized last spring along lines of a preliminary study made for Defense Secretary Forrestal by Maj. Gen. Oliver P. Echols, now president of the Aircraft Industries Association and wartime head of Air Force procurement at Wright Field. Rear Admiral Alfred M. Pride, chief of the Navy's Bureau of Aeronautics, is chairman of the committee. Other members are: Brig. Gen. J. K. Christmas, Army; Rear Admiral E. W. Litch and Capt. L. Harrison, Navy; and Maj. Gens. E. M. Powers and F. H. Smith and Brig. Gen. A. A. Kessler, all of the Air Force.

This committee will cover the following subjects formerly assigned to the old Aeronautical Board: aircraft production and procurement programs; supply and maintenance; aircraft ordnance and armament; design criteria; aviation ground and seadrome visual aids; airport lighting and marking; cockpit layout standardization; flight testing techniques; trainer standardization and aviation radio and electronic aids and instruments.

The Research and Development Committee will assume all assignments of the Aeronautical Board's Research Committee except on subjects specifically mentioned above.

Early Settlement Hopes Fade for National Strike

Hopes for early settlement of the six-months-old National Airlines pilot strike have faded again.

NAL President G. T. Baker, in a letter to the National Mediation Board, said his company has found it impossible to accept recommendations made last month by a Presidential emergency board. The fact-finding panel had charged National with violating the Railway Labor Act and had called on the carrier to reinstate its discharged union pilots and rehire striking clerical and mechanical personnel.

▶**IAM Agreement**—Following the emergency board's report, National and the International Association of Machinists signed an agreement under which the striking clerical and mechanical employes were to return to work starting last week. But the dispute with the Air Line Pilots Association continued, although ALPA has accepted the fact-finding group's recommendations.

Baker told the NMB that the President's board was created "after the pilots' union had lost its strike and when National was in full operation." If the company followed the panel's recommendations, Baker declared, the entire system of collective bargaining would be undermined.

▶**Offer to Pilots**—The NAL president said that during mediation efforts by the emergency board the company offered to re-employ its former union pilots to fill existing and future vacancies. "This offer is still good," Baker emphasized. He added that if the recommendations of the emergency board that National reinstate all striking employes at the expense of their duly-hired replacements became a precedent, it would make the strike a weapon of force against which management, prohibited for attempting to continue its business, would have no defense."

Jet Engine Sales Queried in Commons

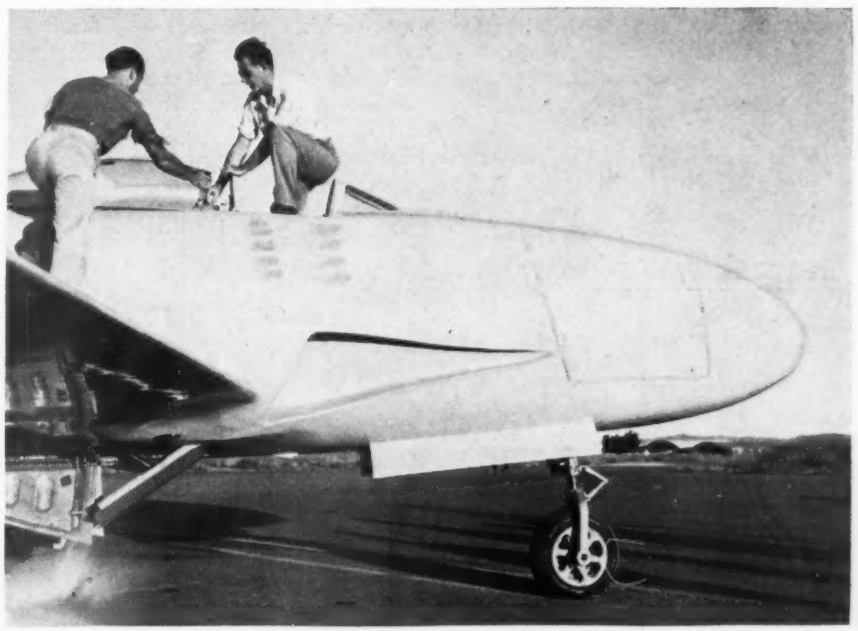
LONDON—Shipment of 55 jet engines from England to Russia, and a recent statement by Economic Cooperation Administrator Paul G. Hoffman combined to cause consternation in the British House of Commons.

The jet engines delivered under contracts signed in August, 1946, and March, 1947, between the British and Soviet governments, were Rolls-Royce Nene and Derwent turbojets removed from the British secret list.

▶**Aid Jeopardized**—ECA Administrator Hoffman's statement that any country which supplied jet engines or other goods of potential military value to Russia or other countries east of the Iron Curtain might jeopardize its chances of receiving further Marshall aid brought immediate Commons reaction.

Rolls Royce, manufacturer of the engines concerned, stated that it is very easy to be wise after the fact, and that two years ago both the U. S. and Britain officially still regarded Russia as "our glorious ally."

▶**No More**—Final shipment of the engines was completed in January of this year. There have been no other deliveries of gas turbine engines, and clearly no more shipments are likely in the near future.



FLUSH INLET F-80 TESTED

First photo of experimental Lockheed F-80R special racing plane equipped with flush air inlets shows neatness and simplicity of installation over production version. Flush inlet was developed by NACA to reduce external drag of inlet while preserving pressure recovery characteristics. While tests to date have not proved satisfactory with this particular installation, refairing of the lines of the inlet is expected to achieve full benefit of the installation. Ryan XFR-4 also has been tested with flush air inlets.

INDUSTRY OBSERVER

► **Preliminary design data on the Lockheed XP3V-1 is being studied by Navy Bureau of Aeronautics, and negotiations are under way for an experimental contract. The new craft uses both turbojet and propeller power and is designed for operation aboard the new 65,000-ton carrier. It is a shoulder-wing monoplane and will be equipped with advanced anti-submarine warfare electronic equipment. It is not much larger than the world-record-breaking P2V Neptune but will have considerably improved performance.**

► Northrop XF-89 twin-jet, all weather fighter has been trucked under heavy canvas to Muroc Air Force Base, Calif., for preliminary ground tests with first test flight scheduled for middle of this month. The plane features side-by-side location of twin J-35 turbojet engines in belly. Airframe of Northrop's X-4 research plane is complete and is awaiting powerplant installation, which is behind schedule.

► **Gilfillan Bros. of Los Angeles, makers of GCA and search radar, are developing a new type of radar for use in directing airport ground traffic during periods of poor visibility. Both military and civil all-weather flying experts consider precise control of taxiing ground traffic, a must for completely all-weather air operation.**

► International airfreight shipments to Europe have dropped off rapidly since the acute Berlin situation. Exporters, who ordinarily have to wait two weeks for payment from European purchasers, feel that any crisis that might develop within that two-week period after shipment could hold up indefinitely payment on their goods. So July, a bad month anyway for overseas shipping, is even worse. Only carriers not feeling the drop are those engaged in the airlift of equipment and personnel from this country to the Berlin zone.

► **Port of New York Authority plan for acquisition of Teterboro Air Terminal from Fred Wehran, present owner, is at a standstill. Negotiations are still going on, but no definite conclusion is expected within the month. Meanwhile, Teterboro is interested in moving Slick Airways from Newark Airport to its site. Previously, Wehran had offered Earl Slick, president of the freight carrier, the opportunity to purchase Teterboro for $3,000,000.**

► Early detection of the post-certification bugs inherent in any new airplane may be anticipated for the Convair-Liner as a result of a two-months' shakedown program just instituted by Western Air Lines.

WAL's demonstration of San Diego-Seattle Convair-Liner service, set for inauguration Sept. 1, was given last month with full load flights over the run with western aviation editors, news reporters, and radio commentators. The sample run produced a cruising speed of 265 mph., to which Western doubtless will adhere, at altitudes up to 16,000 ft.

Bugs produced: left engine miss—corrected by change of sparkplugs at terminal; mild explosive decompression at 16,000 ft.—a faulty antenna lead seal in roof of cabin blew out; plane grounded at Oakland, at conclusion of test, by failure of left propeller pitch control—oil leak shorted control motor, which was replaced in 15 min. after delivery of new motor.

Tired at close of two days of flight and ground entertainment, press group showed no irritation at plane's cabin sound level, slightly high due to beat of jet thrust exhaust system. Convair currently is developing four test exhaust tube extensions which are expected to deflect exhaust sound cone from fuselage.

Convair-Liners currently are flying with wing heat deicing systems sealed. CAA requirement that the wings be opened every 100 hours for corrosion inspection of the system has led Convair to design a substitute heat exchange system for wing heat. Approval tests will be flown in late summer as soon as adequate icing clouds can be located.

Wood to Illinois

John W. Wood, a leading designer of airports, has been named an associate professor of architecture at the University of Illinois.

During the war he was chief of the airport layout and safety unit, engineering and development branch of Air Force headquarters.

Author of many books on airport design, Wood was airport analyst for the Port of New York Authority from 1943-45.

AVIATION CALENDAR

Aug. 18-20—Society of Automotive Engineers, West Coast meeting, St. Francis Hotel, San Francisco.
Aug. 24—ICAO African-Indian Ocean regional air navigation meeting, Seattle.
Aug. 26-27—International Wakefield Trophy Model Airplane Meet, Akron, Ohio.
Sept. 4-6—National Air Races, Cleveland.
Sept. 5-11—Seventh International Congress of Applied Mechanics, Imperial College of Science and Technology, South Kensington, London, England.
Sept. 7-12—SBAC aircraft show and display, Farnborough, England.
Sept. 9—IATA legal committee, Brussels.
Sept. 13—IATA executive committee, Brussels.
Sept. 13-17—National Instrument Conference, Instrument Society of America, Convention Hall, Philadelphia.
Sept. 14-18—IATA fourth annual general meeting, Brussels.
Sept. 19-21—Twelfth International Convention, Northwest Aviation Planning Council, Vancouver, B. C.
Sept. 20—IATA executive committee, Brussels.
Oct. 6-8—National Association of State Aviation Officials, Copley Plaza, Boston.
Oct. 6-9—Society of Automotive Engineers aeronautic meeting, Biltmore Hotel, Los Angeles.
Oct. 14—Annual Air Line Dispatchers Association convention, Edgewater Beach Hotel, Chicago, Ill.
Oct. 15-24—International aircraft exhibit, Royal Danish Aeronautical Society, Copenhagen.
Oct. 17-21—National Aviation Clinic, Detroit.
Oct. 21-22—Society of Automotive Engineers production meeting, Statler Hotel, Cleveland.
Oct. 22-23—4th Annual Arizona Aviation Conference, sponsored by Chamber of Commerce, Prescott.
Nov. 4-5—Society of Automotive Engineers, fuels and lubricants meeting, Mayo Hotel, Tulsa, Okla.
Nov. 9—ICAO operations division, Montreal.
Nov. 15-17—Aviation Distributors and Manufacturers Assn., sixth annual meeting, Hotel Statler, Cleveland.
Nov. 15-17—National Aviation Trades Assn., annual meeting, Allerton Hotel, Cleveland.
Nov. 16—ICAO airworthiness division, Montreal.
Nov. 16-18—National Association of Travel Officials, Miami Beach.
Nov. 23—ICAO southeast Asia regional air-navigation meeting, New Delhi.
Dec. 2-5—Fourth annual international aviation celebration, El Paso.
Jan. 10-14—Society of Automotive Engineers, Annual Meeting and Engineering Display, Hotel Book-Cadillac, Detroit, Mich.
Apr. 11-13—Society of Automotive Engineers, National Aeronautic Meeting, Hotel New York, New York.
July 3-4—First annual Southern California International Air Races, Long Beach, Airport.

Production Progress Report

AIRCRAFT Month	Personal Type No.	Personal Type Value	Transport Type No.	Transport Type Value	Military No.	Total No.	Total Value*
January	458	$2,055,755	13	$2,498,533	140	611	$9,326,677
February	453	2,148,200	14	2,994,084	155	622	10,188,587
March	571	2,522,326	14	5,198,991	278	863	12,490,038
April	750	3,028,139	16	5,401,869	165	931	13,016,444
May	778	3,164,874	34	15,819,336	141	953	23,310,207
Total	3010	$12,918,794	91	$31,912,813	879	3980	$68,331,953
Revised Total	2988	$12,828,817	91	$32,912,813	879	3958	$69,404,428

(These figures include first-quarter revisions, not itemized by month.)

ENGINES Month	Civil No.	Civil Value	Military No.	Military Value**	Total No.	Total Value***
January	779	$4,721,385	287	$18,885,879	1066	$23,675,922
February	1007	5,380,545	355	20,504,714	1362	25,938,747
March	1093	5,174,775	379	24,893,251	1472	30,157,553
April	975	5,234,761	416	25,601,422	1391	31,121,882
May	1293	4,801,522	491	25,500,263	1784	30,570,757
Total	5147	$25,312,988	1928	$115,385,529	7075	$141,484,861

** Does not include value of military shipments, but includes aircraft parts and conversions.*
*** Value represents all payments from military during month, whether or not for engines delivered.*
**** Includes parts.*
Figures based on "Facts for Industry," Bureau of the Census.

PERSONAL AIRCRAFT

Company	June No.	June Value	Jan.-June No.	Jan.-June Value
Aeronca	77	$219,000	426	$1,154,000
Beech	84	677,000	403	3,128,000
Bellanca	1	5,000	19	95,000
Cessna	179	741,000	769	2,789,000
Eng. & Res.	24	62,000	81	215,000
Fairchild	4	17,000	39	161,000
Luscombe	80	245,000	371	1,021,000
Piper	267	506,000	866	1,651,000
Republic	5	23,000	16	66,000
Ryan	71	479,000	279	1,836,000
Stinson	90	462,000	557	2,753,000
Taylorcraft	9	16,000	36	65,000
Texas Engineering	29	111,000	144	465,000
Total	916	$3,563,000	4006	$15,399,000

Figures as reported to Aircraft Industries Association.

Reports Indicate Industry Upswing

Value of civilian airframe deliveries in May shows great gain over April as transport shipments rise.

By William Kroger

A cautious optimist last week could see an upswing in the fortunes of the aircraft manufacturing industry. Latest government figures show civilian business in May well ahead of the preceding month; another government survey indicates total sales are running well ahead of last year, and some midyear company reports once again are listing profits.

The most reliable current guide to the state of the industry, the Census Bureau monthly report, tabulated terrific gains for May over April: 40 percent increase in airframe weight (2,843,600 vs. 2, 026,800); transport deliveries up from 16 to 34 planes; total deliveries up from 931 to 953 planes; and value of deliveries up from $13,016,444 to $23,310,207.

►**Transports the Difference**—The boost in value of deliveries was accounted for almost completely by transport planes (in large measure, presumably, by Consolidated Vultee's Convair-Liner). The stepped-up transport sales should hold steady or increase, rather than wane in forthcoming months.

The Census figures report that at the end of May the transport backlog totaled 282 planes (against 311 in April). Better than 100 of these probably are Convair-Liners which are now moving to customers. At least 55 more should be Boeing Stratocruisers. While deliveries on the latter will not begin until fall, the higher cost of these planes (about $1,250,000) could take up any slack caused by the dwindling by that time of other transport deliveries to their purchasers.

The value of civilian deliveries up to May of this year ran nearly $3 million less than for the January-May period of 1947. This was due chiefly to lower personal plane sales—$12,828,817—this year against $31,216,249 last year. Another factor is the shift of conversion work from aircraft plants to airlines and overhaul firms. As the Census Bureau reports only that conversion work performed by plants producing complete aircraft, value of this type of work for January-May of this year dropped to $14,015,513 from $23,176,809 as reported last year.

►**Military Sales**—The upswing in May sales reported by the Census Bureau takes on added importance by the very omission of military payments data. The impression is strong that by this time military payments to manufacturers are running well ahead of last year. Some light on this may be shed later in the month when the Census Bureau is expected to issue semi-annual sales data including information on military payments.

Meanwhile, Securities and Exchange Commission has reported that first-quarter sales of 26 aircraft and aircraft equipment manufacturers totaled $274,912,000. This figure includes some military payments, as two manufacturers, Boeing and Grumman, noted that because of long-term contracts no three-month figure could be taken as truly representative on their respective businesses.

This sales total for the first quarter of 1947 is compared to $215,685,000 for the first quarter of 1947. Even if the first-quarter 1948 total were to be doubled to arrive at an approximation of six months' income (and chances are that the second quarter was better than the first) the resulting figure would pass the half-billion dollar mark. It is not at all unlikely that military payments in the last six months will exceed those of the first half-year. That would push the industry toward a record peacetime income, and operating profits recorded in the aviation industry for the first time since 1945.

►**Company Reports**—Operating as well as net profits already have begun to show up. Curtiss-Wright and Republic have reported net profits of $26,081,367 and $1,826,668, respectively, for the six months ending June 30, and now Martin is in with a semi-annual statement showing a $613,127 operating profit, but a net loss of $719,034. Martin sales for the six months ending June 30 totaled $26,688,328.

Despite this more favorable report (Martin lost more than $19 million for the full year of 1947), the Martin picture still is clouded by high investments in the 2-0-2, carried at $15,421,000 as of June 30. Company backlog increased from $105,000,000 on Dec. 31 to $122,000,000 on June 30.

BRIEFING PRODUCTION NEWS

▶**B. F. Goodrich Co.** has developed a new type fabric woven of yarn which has been wrapped and heat-sealed in a fine Avtrim film for use as tapes and fabrics for bucket seats, tie-down straps and litter holders, and as upholstery and wall covering in the air transport field. The Fiberglas synthetic yarn is flame resistant and may be dyed any color or woven in plaids or stripes.

▶**Texas Engineering and Manufacturing Co.** has received a contract for the rehabilitation of 95 fighter planes purchased recently by the Chinese government. The planes are 53 North American P-51s and 42 Republic P-47s. The contracts will extend into January, 1949. TEMCO backlog is now more than $7,000,000 including C-54 overhaul and Martin 2-0-2 modifications.

▶**Stanley Aviation Corp.** has been formed by Robert M. Stanley, former vice-president-engineering of Bell Aircraft, and has received about $100,000 in Navy contracts for the manufacture of electronic instruments. In addition, two other government contracts are being negotiated. Stanley now has 22 on the payroll and is looking for suitable plant facilities in Buffalo. The staff is made up entirely of former Bell personnel, including Milo R. Simmons, helicopter engineer. Stanley will concentrate on guided missile research and hopes to enter the aircraft construction field at a later date.

▶**Link Aviation, Inc.** is nearing completion of its jet plane trainer under an Air Force development contract. Edwin A. Link, company president, states the new trainer is "the most advanced trainer ever built by the firm and makes use of electronic, pneumatic, electrical and mechanical systems to synthesize all the conditions of jet flight."

▶**Consolidated Vultee Aircraft Corp.** delivered four Convair-Liners in the week ending July 31, the most so far delivered in a single week. American Airlines took three, Western Air Lines one. Liner deliveries now total: 41: American, 29; Pan American, seven; Western, four; Continental Air Lines one.

▶**Turco Products, Inc.**, Los Angeles, has selected McCook, Ill., as site of its new plant. The plant will increase the company's production of specialized industrial cleaning compounds.

▶**Edo Corp.**, College Point, N. Y., has shipped 20 sets of model 2000 floats to the Argentine government for installation on Piper Super Cruiser aircraft. The float Super Cruisers will be used for civilian flight training purposes in Argentina.

Strike Report

Ryan workers back; Douglas gives raises; Boeing hiring slows.

One strike was ended, another was postponed, but a third dragged on as West Coast manufacturers last week looked over the labor situation.

The 41-day strike at Ryan Aeronautical Co., San Diego, ended when company and union (United Auto Workers) agreed on a wage increase averaging 10 cents an hour. The union originally had asked for a boost of 16 cents an hour, reducing this by stages to 9 cents and six paid holidays. The new agreement provides for four paid holidays, as did the old.

In an attempt to continue production, Ryan hired nonunion workers during the strike. As the agreement calls for rehiring the strikers, the company will wind up with a payroll of about 1900 instead of its former total of about 1600.

Douglas Settles—Douglas Aircraft Co.'s labor contract troubles eased when the UAW local for its Long Beach plant called off a strike and accepted a 10-cent-an-hour wage raise, and the International Association of Machinists local at the El Segundo plant postponed a strike scheduled for July 28.

The El Segundo union, which represents 5000 of that plant's 6500 employees, decided that "sufficient progress' had been made in the negotiations to warrant postponement of the strike. Discussions with an IAM local at the Santa Monica plant were continuing with hopes high of a strikeless settlement.

▶**Boeing Still Out**—But up at Seattle, the situation is different. The recommendation of a National Labor Relations Board examiner that Boeing Airplane Co. be compelled to bargain with striking IAM workers has seemed to work against the company's plans to resume production.

Boeing had been succeeding with a back-to-work campaign and seemed to be in sight of its goal of a 14,000-man production force by Aug. 1 when the NLRB examiner's report came out. Last week rehirings were off, and Boeing was still 2000 men short of its goal. Probable reason: fear of would-be workers that the union would win and force out employes hired during the strike.

Following the examiner's recommendation, the union offered to end the strike and send the men back to work if the company would resume bargaining. Boeing refused, intimating that the union no longer is the proper bargaining agent, and that the workers have joined other unions, presumably the AFL Teamsters.

USAF Orders 41 C-W Flight Simulators

Curtiss-Wright's electronic flight simulator will soon be "thinking out loud" for Air Force pilot trainees, making it more likely that their errors and crack-ups are harmless.

An Air Force production order for 41 of the flight simulators (at a reputed cost of "over $2,000,000") is seen as the answer to a more complete and less costly method of pilot training. Invented and developed by Dr. R. C. Dehmel, chief engineer of the electronic department of C-W's propeller division, the simulators resemble in theory the one currently used by Pan American Airways to train Stratocruiser pilots (AVIATION WEEK, May 24).

Air Force simulators will be a mockup of the North American T-6 (formerly designated AT-6).

▶**Tenth the Cost** — Curtiss-Wright President Guy Vaughan recently estimated that as a "training plane," the simulator "can handle four times the number of flight and ground crews at a tenth the cost and in a fraction of the time involved in the use of the actual airplane."

The Air Force became convinced of this after two prototype units of the simulator underwent exhaustive testing by the Air Materiel Command and the Air Training Command.

Westinghouse Scores

Westinghouse Electric Corp. hit a record high of $424,456,102 during the first six months of 1948, a seven percent increase over the previous high of $395,564,740 set on the same period of 1944. Net profit for the first half of 1948 amounted to $24,941,100 equal to $1.83 a share.

"MOST OF ALL I wanted safe and trouble-free operation for my air ambulance and my own plane. So, knowing from experience with my ground fleet of ambulances and personal cars that Esso Products are of high quality ... I naturally decided on Esso for aviation fuels and lubricants."

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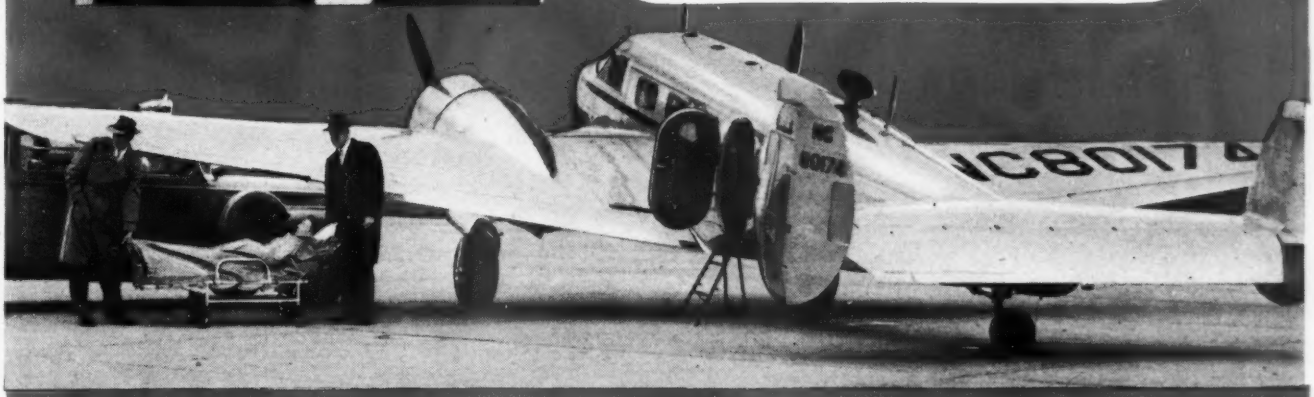

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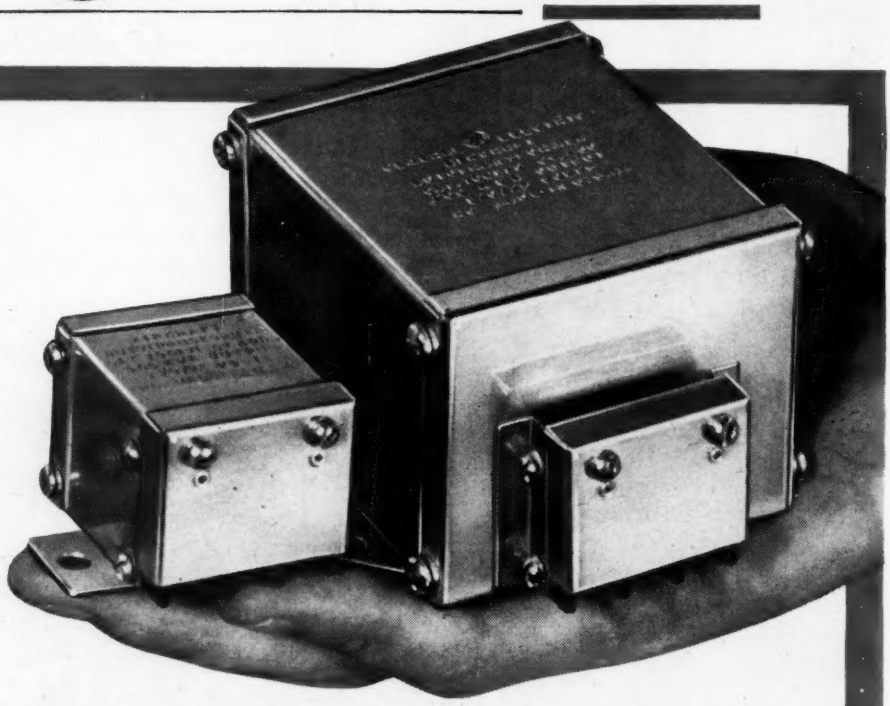

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28 volts from a 400-cycle 120-volt power source

We call this our "utility" line—a group of lightweight autotransformers, developed to satisfy many requirements for single-phase power supplies. It covers a wide range of capacities and a wide range of sizes—from small to smaller. The transformer on the right has a capacity of 300 volt-amperes, measures 3¼ in. high and weighs 4¾ pounds. The one on the left is rated 5 volt-amperes, stands 1⅜ in. high and weighs just 4 ounces.

The complete line includes eleven ratings—each housed in a cadmium-plated steel case, and with its core-and-coil imbedded in an asphalt-based compound for high dielectric strength and efficient transfer of heat. All units have enclosed terminal boards of Textolite, barrier guards to separate terminals, and terminal covers as protection against shock and accidental short circuits. Even though midget in size, every detail of their construction has been carefully worked out to assure dependable operation under all conditions.

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Transformers for Aircraft

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- Phase-changing transformers
- General-purpose transformers
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All General Electric aircraft transformers are designed to:

- Give dependable operation at altitudes up to 50,000 feet
- Operate in ambient temperatures from —70 C to 71 C
- Tolerate normal frequency variations in power supply
- Withstand vibration and shock
- Keep weight and size to a minimum

Control sensitivity of Rotor-Craft, tandem rigid-blade helicopter, is demonstrated by designer Magill (right) to Aviation Week's correspondent. The control column is in center and Magill's left hand is on combination throttle and collective pitch lever. Other lever near Magill's left hand is non-production rotor paddling control used only for experimental purposes.

Rigid-Blade Helicopter Undergoing Tests

Rotor-Craft Corp.'s design based on novel principles, including swashplates at bottom of driving shafts.

By Scholer Bangs

West Coast testing of Rotor-Craft Corp.'s tandem rigid-blade helicopter gives stimulating evidence of the changing state of rotary wing designing.

Although three years old in its technological evolution, the experimental Rotor-Craft is "new" to the extent that design details now are presented for the first time.

It acquires importance by close adherence to three primary helicopter development trends:

- Simplicity of structure and parts.
- Production economy.
- Flight stability without loss of control sensitivity.

▶ **Rigid Rotor System**—Further, it is one of only two copters under development in this country employing a true rigid rotor system—blades rigidly attached to the hub, and rotor disk which is rigid in relation to driving shaft installation.

Earlier in the air with a rigid rotor configuration was the dual-rotor design of Landgraf Helicopter Corp., mounting rotors at extremities of arms extended outward and up from fuselage (AVIATION WEEK, Mar. 29).

While the rigid rotor principle has presented alluring structural simplicity (applied as early as 1906 by Paul Cornu to a tandem rotor structure which had rigidly braced blades and achieved limited hovering flight) recent designers understandably have fought shy of tackling a rotor system presenting exceptionally complex aerodynamic problems, preferring to use hinged blades, for which a wealth of data and experience was available.

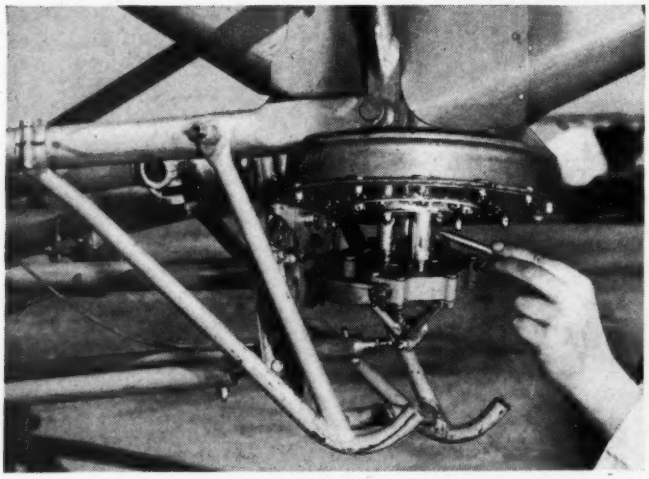
Thus the general approach to other rotor methods: Hinged and flapping rotors; the see-saw attachment of rigidly-opposed blades to a driving shaft; and the universal shaft mounting of rigidly-opposed blades.

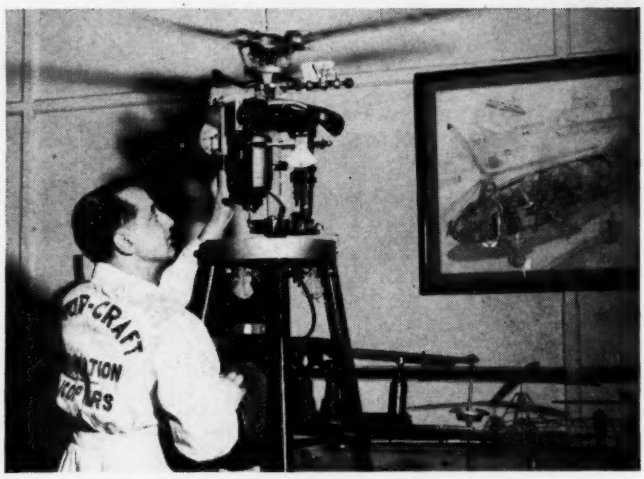
That Gilbert Magill, 35-year-old president of Rotor-Craft, chose to attempt this hazardous design from the standpoint of ultimately successful performance, probably was due to the challenge of rigid rotor simplicity.

▶ **Design Undertaken**—Once committed, and discovering little other than design failures as engineering precedent for what he was about to attempt, he was forced to salvage both ego and his small company by invention and applied research.

The result—made possible by funds from stockholders and an Air Force experimental contract—is a helicopter which shows considerable promise and offers several radical design features.

To the several major manufacturers who have shown watchful interest in Magill's progress, a noteworthy aspect may be that he has received delivery of a set of six new 9-ft. laminated birch rotor blades produced for him by U. S. Propeller Co. of Pasadena, Cal., at a





Photo, left, shows rear rotor swashplate assembly. Pitch control rods extend up within tubular drive shaft to control arms attached to rotor spindles. Plate housing is supported by fork connected to rotational control rod actuated by foot pedals to introduce turning moments. Push-pull rod tilts swashplate fore or aft for forward or backward flight. Other push-pull rod raises and lowers plate, via terminal crank, for collective pitch change. Right: Magill demonstrates operation of rotor test stand he designed.

total cost amounting to only $1600.

His avoidance of a conventional costly built-up blade, requiring careful and expensive weighting to solve flutter and control forces throughout the range of cyclic pitch changes, stems from offset attachment of blades to the hub with relation to the driving shaft.

Conventionally, and as in the Landgraf design, rigid rotor blades have been rooted with their span axis aimed directly at the driving shaft's center of rotation.

▶ **Swashplate Change**—Magill attaches his blades so that the span axis of each is at the rear of the driving shaft.

This, in itself, is of little aerodynamic significance; but it was important as a solution to one of the designer's approaches toward rotor assembly simplification.

Magill was bound, with his rigid rotor concept, to acceptance of the conventional swashplate application of cyclic pitch control. However, he envisioned two departures from the usual swashplate installation. He wanted to eliminate from the rotor hub area the birdcage of external control rods and moving parts. And, he wanted to reduce parts.

The first objective, indicated installation of pitch control rods within a hollow driving shaft. The second called for a swashplate at the bottom of the driving shaft and in line with cockpit controls in the lower portion of the fuselage.

He found that by linking cockpit controls to a swashplate mounted at the base of the driving shaft he could eliminate one-third of the parts which would have been required to carry control movements from cockpit to a swashplate assembly mounted outside the driving shaft and immediately beneath the rotor hub.

Gathering of pitch change rods within the driving shaft suggested, for structural simplicity, attachment of each blade at a point behind the driving shaft so that an arm could be extended from the blade root through a slot in the shaft to attach to the blade's particular pitch control rod.

With this hub configuration, Magill was able to work out, with greater economy of parts than had his blades been mounted with axis line directed at the driving shaft center of rotation, the distinctive blade positioning reported to have solved critical blade stress problems and permitting the use of a simple, low-cost blade.

▶ **Blade System**—He says that the idea for his blade mounting system developed from considering three techniques for resolving forward flight differences in lift between advancing and retreating blades: 1. By cyclic blade feathering. 2. By employment of a flapping blade using vertical travel up and down to reduce the angle of attack of an advancing blade and increase the angle of the retreating blade. 3. By blade pivoting, fore and aft, to allow the advancing blade to drop back and the retreating blade to move ahead, therefore tending to equate advancing and retreating velocities.

Magill claims that in his blade system, all three of these techniques are combined so that the blade tip moves upward and back in reducing pitch, and down and forward in increasing pitch development.

This is accomplished by mounting of the blade at the hub in such a manner that during pitch changes the blade pivots about a point above and ahead of the airfoil. The resultant "flapping" action greatly reduces the amount of cyclic feathering which otherwise would be required if the blade were not offset from its pitch change axis.

Beyond achieving economy of parts in the control assembly, and an externally clean rotor hub, displacement of the span axis of the rotor blade aft of the driving shaft facilitated positioning of the blade pitch change pivot point in a manner meeting a maximum of aerodynamic objectives.

He told Aviation Week: "Only through this positioning of the blade span axis could we achieve a balance of forces acting on the blade, and do it in such a way as to minimize strong twisting forces acting upon the blade structure.

"If the span axis had been elsewhere, either the lifting forces or centrifugal twisting moment would have been overpowering. With the span axis in the position we employ, these forces tend to act in opposite directions, and almost completely cancel out.

"Inasmuch as the 'flapping' action of our rigid rotor is extremely small in comparison with the usual hinged rotor blade, we are able to use a blade constructed without reference to the usual requirement of having the center of gravity coincident with the blade's center of pressure. Rotor-Craft's rigid rotor system accepts without difficulty the separation of C.G. and C.P. in using a solid laminate blade, and offers our ultimate use of a very simple blade developed from a swaged metal tube.

"Our blade shows C.G. at approximately 44 percent of chord, and C.P. at 25 percent."

Still subject to proving tests is Magill's assurance that his rotor system will permit an "ideal" configuration which will result in blades moving automatically to their most efficient angle of attack in event of a failure of the cyclic pitch control system.

He declares that aerodynamic forces can be made to centralize blades at 10 deg. pitch with power on, in event of a

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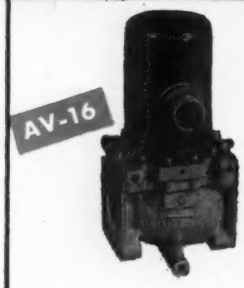

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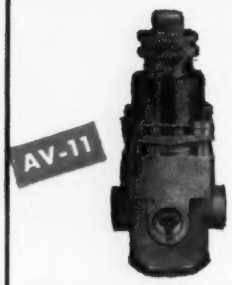
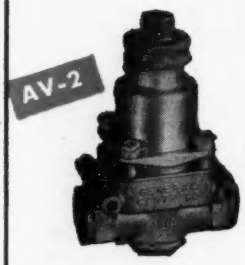
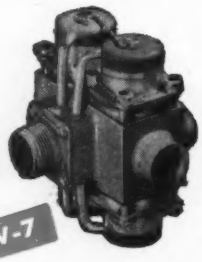


3-way Electro-Magnetic valve used for distribution of fluid flow or for "feed in" and "exhausting" fluid from a cylinder, piston or vessel.

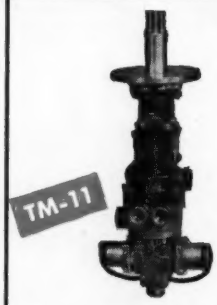


Same as AV-1 except is normally open type. For control of various fluids, oil, water, gasoline, air, etc.



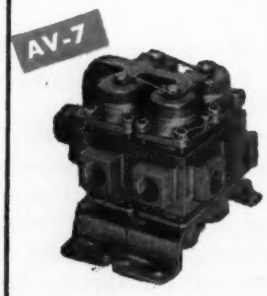
Four-way selector type control—operating pressure up to 3000 P.S.I. for control of fluid pressure operated cylinders.

Electro-Magnetic valve for medium and high pressure applications. Controls hydraulic oils, fuels, lubricating oils, water, etc. 50 P.S.I. to 3000 P.S.I. operating pressure.

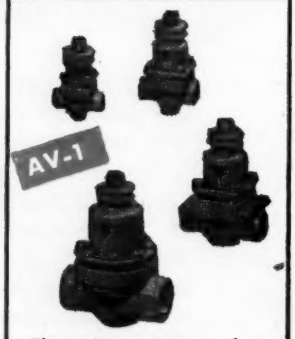


Temperature modulating control—providing fully automatic electro-hydraulic operation for control of engine coolant and lubricating oil.

Normally closed type Electro-Magnetic valve—for control of all types of fluid, gasoline, air, water, hydraulic fluids or oils, anti-icing fluids, etc.



Electro-Magnetic Double-Four Way selector type valve for control of fluid pressure operated cylinders.



Electro-Magnetic type valves with various magnet sizes, full ported or restricted ports, for all types of fluid, gasoline, air, water, oils, etc.

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control system failure, and reduce pitch to 4 deg. for autorotation.

► **For Stability**—Importance equal to that of Magill's rotor assembly attaches to a rotor loading system designed to give the Rotor-Craft inherent stability.

While Magill is hesitant in disclosing in detail the elements of his approach to the stability problem, he is willing to show in a general manner the course he has pursued.

Pending full flight tests of the prototype, one must accept the evidence of small hand-launched models as demonstrative of basic stability of the design.

The key to his claim of stability is in placement of the C.G. of the complete helicopter at a distance approximately 40 percent to the rear of the front rotor shaft, thus imposing a somewhat heavier disk loading upon the forward rotor than the rear rotor.

Apparently, the tendency of Rotor-Craft models to return to horizontal forward flight following the application of directional, lateral, or longitudinal disturbing forces results from a combination of unequal disk loads with travel of the C.P. about each disk in application of unbalancing forces.

Magill reports that during initial free flight model experiments, in which disk loadings were identical, instability was little short of catastrophic. However, when he moved the fuselage C.G. forward "to see what might happen" the model displayed stability which prompted extensive research and final application of the principle to the full scale prototype.

The experimental craft shows moderate displacement of disk planes with relation to each other, achieved by a tilting of the rear rotor driving shaft ½ deg. to the left from vertical. The designer indicates that this is done to offset minor torque differences between the two rotors.

► **Specs, Standard Parts**—Present flight test model weighs, with two people, 1350 lb. and has a disk loading of 2.3 lb./sq. ft. Disk diameters are approximately 18 ft., and a disk overlap is produced by a distance of 12 ft. 4 in. between driving shafts. Rear rotor is positioned above the forward. Engine is a 110-hp. 4-cyl. Continental C-100, modified to deliver 3200 rpm. Gearing produces a rotor speed of approximately 1/7 engine speed.

An interesting feature in the powerplant area is the use of standard automotive parts wherever possible. Rotor clutch, housed in a suction fan engine cooling assembly, is a reworked Ford unit. In the magnesium gearbox (2-to-1 ratio), final rotor drive gear is a Studebaker free-wheeling unit.

► **Controls**—All control is by rod linkage. Foot pedals are connected to swashplates for directional control, and a single control stick administers remain-

ing swashplate universal positions.

At pilot's left is a lever serving as combined throttle and collective pitch control. In production models this lever will carry, additionally, either a small thumb lever or twist-grip throttle override. Another lever, close to throttle lever is a research item, installed for rotor paddling tests, and will not appear in a production version.

A characteristic of the craft is its surprising flight control sensitivity. Knute Flint, veteran copter pilot conducting Rotor-Craft tests for Air Forces, reports that not only are control movements exceptionally small but there is no discernible lag in control response.

This correspondent was able to confirm this in a brief working of controls on the ground at just under lifting speed, and particularly noted an absence of feedback of forces into the control column.

A feature of the Rotor-Craft is the aerodynamic self-centering of controls. No spring centering of the control column is employed, yet the stick returns to center in a matter of seconds when released from any off-center position.

Aerodynamic balance of the craft is such that with the ship trimmed and controls neutral a moderate forward speed develops once it is in the air. Slight back pressure on the stick is required for hovering.

► **Undercarriage Features**—Tricycle landing gear system departs from the conventional in employment of an unusual technique to keep main gear wheels vertical throughout all positions of axles which have fuselage centerline attachment and travel through a large arc within limits of oleos having 14-in. travel.

A light "pantograph rod" carried from the oleo fork, outward and above the axle to a point above the bearing linking the wheel fork post to the main axle assures vertical positioning of the wheel at all times.

All wheels are castering, but those of the main gear are held rigid, for ease of ground handling, by shear pins which are intended to break if a strong side force is introduced in a landing.

Magill reports that aerodynamic characteristics of his rotor system are such that cyclic control forces, and blade movements, are relatively small. In banking control, cyclic pitch changes do not exceed 3 deg., plus or minus. Fore and aft movement of the copter requires pitch changes not exceeding 2 deg. plus or minus.

► **Rotor Test Stand**—Discussion of the Rotor-Craft would be incomplete without elaboration upon the manner in which the designer solved aerodynamic problems presented by his rigid rotor concept.

His proposed rotor system was without precedent, and he found an almost total absence of engineering data which could be used in determining the ultimate positioning of blades. He had theories, and his own mathematical calculations to support them, but no physical evidence that they were correct.

To prove his ideas he devised a rotor test stand for reading all forces applying to a ¼-scale rotor assembly.

Mounted solidly upon a heavy four-legged frame, the test rig consists essentially of a rheostat controlled electric motor driving the rotor, a tachometer, and a system of spring loaded balances. The stand carries an adjustable rotor hub, cyclic and collective pitch controls, and azimuth control.

Readings of all control forces can be taken, as well as pitch, roll and torque moments, and lift and side forces—the last in free air tests with the test stand carried on a truck driven at varying speeds on a smooth course.

Says Magill: "We know of no research group which possesses any comparable rotor test stand. It has given us low-cost proof of original theories on rigid rotor systems, and has supplied data never before provided in rigid rotor research."

He is hopeful, but has no positive assurances, that flight tests now in process will induce the U.S.A.F. to offer an experimental production model contract.

Lacking this, he intends to proceed with new capitalization of his company for an attempted invasion of commercial markets.

Magill tells Aviation Week he is convinced that a commercial model having payload rating comparable to other small helicopters now in the field can be produced to sell for $10,000 during manufacture of an initial 500 units, and that after that the price can be scaled down appreciably, ultimately to $5,000 for a two-place model.

McDonnell Names Helicopter Officials

James G. Ray, former vice president operations for Southwest Airways and a pioneer in rotary wing aircraft, has been appointed manager of the helicopter and propulsion division of McDonnell Aircraft Corp., St. Louis, Mo. Robert R. Osborn has been named chief engineer of the same division.

Ray was the first employee of Pitcairn Aviation, Inc., in 1924, and shortly after the company ceased autogiro manufacture in 1938, he helped organize All American Aviation, Inc.

Osborn has been with McDonnell as a consulting engineer since November, 1943. He is a member of NACA's helicopter subcommittee. Osborn's design of the Curtiss "Tanager" won the Guggenheim Award when he was chief engineer of Curtiss-Wright.

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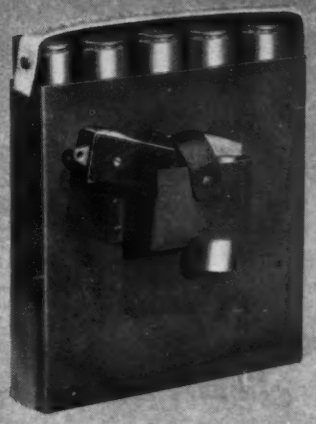

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- **MINIMUM WEIGHT** — Entire kit loaded weighs only 11 lbs.
- **LOW COST** — The lowest priced dependable signal outfit on the market.
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- **EFFICIENT** — Each flare generates over 75,000 candlepower for more than a minute. Complete unit approved by C.A.A. for planes up to 3,500 lbs. gross weight engaged in miscellaneous operations.

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KILGORE MFG. CO.
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As advertised in TIME and NEWSWEEK

From filtering jet engine fuel...

to cleaning compressed air...

put your filter job up to Air-Maze!

To keep trouble-causing dirt out of jet engine fuel is one problem—to remove water, dirt and oil from compressed air lines is another. But there's a special Air-Maze filter *engineered* to solve each of them—just as there are Air-Maze filters designed to solve scores of other filtration problems involving air or liquids.

HAVE YOU A FILTERING PROBLEM? Whether you build or use engines, compressors, hydraulic equipment, lubricating systems, *or any device using air or liquids*—the chances are there is an Air-Maze *engineered* filter to serve you better. Write Air-Maze Corporation, Cleveland 5, O.

AIR-MAZE

The Filter Engineers

AIR FILTERS
SILENCERS
SPARK ARRESTERS
LIQUID FILTERS
OIL SEPARATORS
GREASE FILTERS

Wanted: Better Aircraft Systems

Structural items now seldom fail, while 95% of flight delays is traced to system and accessory troubles.

An airplane which has excellent performance, perfect structure, etc. is only as good as its poorest system. That, in a few words, is the studied opinion of L. R. Koepnick, TWA chief engineer, speaking at the recent National Aeronautic and Air Transport meeting of the Society of Automotive Engineers, in New York City.

This opinion, shared by the vast majority of airline maintenance men, indicates the necessity for a thorough re-evaluation of the various systems in the modern multi-engine transport plane, looking toward increased aircraft utilization and greatly reduced maintenance and allied costs.

► **Structure, Flight Controls Good**—Results of a recent TWA survey of mechanical delays revealed that 95 percent of all flight delays stem from airplane systems and accessories and that less than five percent are due to structural items.

Of these structural items, a large portion resulted from windshield and window failures, indicating conclusively that the aircraft manufacturing industry has done a superb job in the design of the structures of modern airliners.

The survey also showed that there were practically no mechanical delays because of the flight control system, another tribute to modern aeronautical engineering experience.

However, the fact that the aircraft structure and control system have reached this state of perfection is a result of the historic attention paid to these two items in the evolution of the modern airplane, both through industry practice and requirements of the services and the Civil Aeronautics Administration.

There exist comprehensive and detailed requirements for the structure and flight control system in CAA regulations and service contract requirements, but system requirements are vague, debatable and change rapidly.

► **Suggested Procedure**—Koepnick has formulated a detailed program for the development of aircraft systems on new plane designs, together with some basic attendant considerations:

• 1. Airlines and other operating agencies interested in a new model should standardize their requirements for aircraft operating systems.

This is a long-standing complaint of the airframe manufacurers, and the airlines readily admit to all-too-frequent inability to agree on such items as cabin pressurization, heating and ventilating systems. This forces the manufacturer to produce a new aircraft which varies in detail from plane to plane.

To combat increased costs that follow such practice, the manufacturer frequently compromises the design of such systems so that "basic units" will be similar, while allowing for interchangeable detail items. This practice, while logical under the circumstances, often produces excellent systems in some planes and inferior installations in others of the same model, resulting in increased maintenance costs and time out of service.

• 2. Airlines should review the minimum requirements and specify reasonable operating limitations for systems in addition to desired attainment.

It is reasonable to expect superior performance in each new model of accessory and, particularly, to anticipate increased automatic operation of most aircraft systems. This idea has, however, led to many serious and costly mistakes—shared equally by the airlines and the aircraft manufacturer.

A recent example was the insistence of an airline on automatic oil temperature regulator shutter control in a multi-engine transport. The planes were furnished with this equipment as well as automatic cabin pressure regulator equipment.

These units malfunctioned at a high rate in service and the airline recently removed both systems from their requirements in new planes at a saving of $50,000 in cost and a reduction in annual maintenance and overhaul costs of $10,000.

Both oil temperature and cabin pressure regulation are now done manually by the flight engineer.

Airlines are giving increasing attention to manual operation of systems since this affords greater safety, reduces flight delays, lowers first cost and reduces maintenance and overhaul costs.

• 3. During the design of the airplane, the manufacturer should place as much emphasis on each of the systems required as is placed on aerodynamics, stability and structure.

It has long been aircraft engineering practice to proceed with the design of a new craft in the aerodynamics-stability-structure sequence followed by the design and installation of the various systems.

System engineers are forced to compete for space and routes through the

fuselage and wing structure because of the great importance attached to the latter. Most airline engineers would be willing for the performance of the airplane to suffer in favor of structural modifications to accommodate a need in a particular system.

It is preferable that individual systems should be segregated. This would increase safety and greatly reduce maintenance. The use of metal conduit for electrical wiring is a graphic example of segregation and its benefits. Although conduit was abandoned during the war, most airline maintenance men plead for its immediate return.

In a recent case, electrical wiring was located directly under hydraulic lines which developed a leak. The flammable hydraulic fluid soaked into the electrical wiring and produced a fire hazard. It would have been a simple job to reverse this relationship in the design stage, and the airline was forced to perform this job at great cost in service.

• 4. The manufacturer should build a complete system to scale—first to insure it will be within the confines of the space alloted and, second, to permit the complete functional testing of the system. The test program should check the system under all conditions of operation, and the combinations of failures of individual items of the system.

An outstanding example of this approach is the hydraulic system of the Constellation transport. During its design, Lockheed engineers built a complete operating hydraulic system powered by four Ford V-8 engines and fitted with a "cockpit" duplicating the actual cockpit. This system was "test flown" for hundreds of hours and operation was checked under conditions of failure of the various components.

As a result, the hydraulic system of the "Connie," though complicated, caused much less trouble than was expected, and less trouble than simpler hydraulic systems in other craft.

• 5. One or more prototype airplanes should be flown for an extended service test period before the model is released for production.

Two modern examples of this practice are the Northrop Pioneer and the Beech Twin-Quad, both of which will have received a thorough test period before being placed in production.

It is not enough to test systems under laboratory conditions, for numerous examples are available of units working satisfactorily in the lab and proving incapable of satisfactory service in the airplane.

• 6. Develop rigid specifications for systems, using only the most direct and simple manner of accomplishing the desired results. In the design of each system, these points should be carefully considered:

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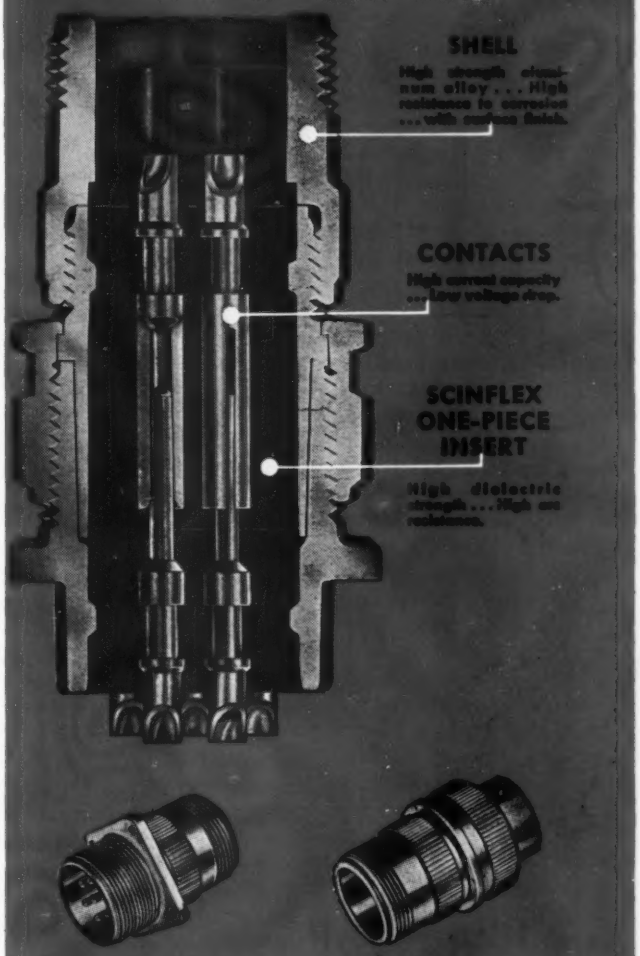
the finest ELECTRICAL CONNECTORS money can build or buy!



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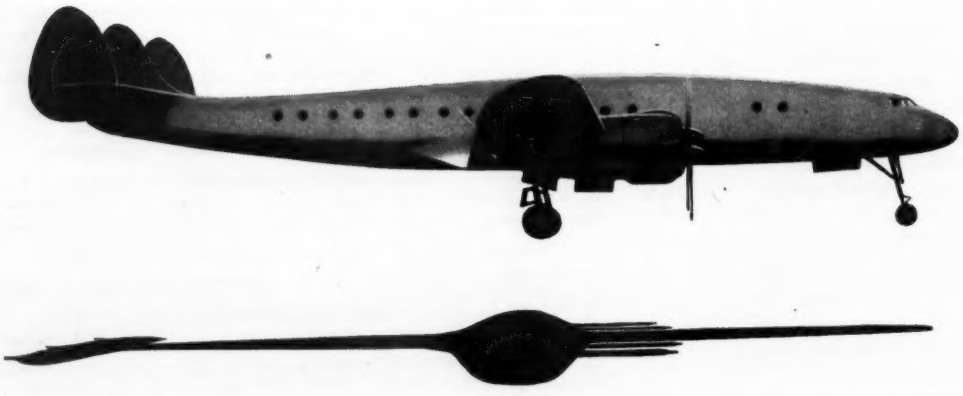


The Lockheed Constellation

The Constellation is flown by more international airlines than any other high-altitude transport...It carries three times as many passengers across the North and South Atlantic as all other aircraft combined...It holds more than 100 speed and distance records (many of them non-stop ocean crossings)...It is the first and only plane to operate around the world on a commercial route ...It has been ordered and reordered by the airlines and the United States Government...

The Constellation has been tried and proven by more than three thousand million passenger miles of commercial service.

LOCKHEED AIRCRAFT CORPORATION

BURBANK, CALIFORNIA

a. Is it necessary for the system to function automatically, or is it conceivably possible to achieve the minimum or desired requirements by manual operation of the system?

b. Analyze the cost, performance and weight of the items specified to give automatic functions and compare with alternate items which would permit manual control.

c. Analyze the system from a maintenance viewpoint, considering accessibility and possibility of grouping all functional items into one package.

d. The systems must be segregated and over-all space requirements for the entire system determined.

One of the methods through which these recommendations might be executed is for aircraft manufacturers to require previous airline experience by a portion of all new engineers hired.

In addition, engineers should be sent out to the airlines at six-month intervals to acquire first-hand knowledge of maintenance and service difficulties.

It is not considered enough to have professional "service engineers" available to the airlines for, valuable as they are in providing solutions to current problems, they probably do not exert sufficient influence on new design. Designers themselves must acquire first-hand knowledge of the airline problems if maximum utilization of airline experience is to be obtained.

Douglas Aircraft Co. put many of these recommendations into practice recently in the design of the DC-9 model by conducting an extensive survey of airline service and maintenance requirements and empaneling representatives of airlines in a series of conferences during the preliminary design stage of the plane. Douglas prepared a "complexity comparison" between the DC-9 and the DC-3 and DC-6 craft to illustrate what can be accomplished towards simplification of systems.

► **"Packaged" Components** – One approach to the problem of simplification is the use of the "package," in which the components of a complicated system are mounted together on a common panel for quick removal. When trouble develops, the entire panel is quickly replaced by another panel which has been tested and approved by the shop. The faulty panel can then be disassembled and repaired without delaying the departure of the plane

Although this system permits immediate replacement of the package it has proved more costly because of the necessity for stocking entire panels rather than individual units having a high incidence of malfunction.

Thus, TWA stocks heater panels which represent an investment of more than $100,000 while the individual heating system components required for stock would have cost only about $25,000. This is a $75,000 penalty in order to permit rapid replacement of a unit.

There is no question but that the modern multi-engine transport is complex and that many thousands of items crowd for attention in its interior.

A modern four-engine transport burns more gasoline in a single day than is used daily in a town of 4-5,000 people.

It is equipped with more instruments than 20 Diesel locomotives.

Its wings enclose a structural frame much stronger than many bridges.

It is equipped with radio and electronic equipment which would compare favorably with that in a small broadcasting station.

And all of this equipment must be enclosed in a very small space.

This complexity probably results from a combination of aircraft manufacturer, the airline and the government all working toward safety but each taking a slightly different (sometimes duplicating) path.

We have now passed into an era in which aircraft systems, and not aerodynamics or structures, are the primary problems.

To date, accessories and operating systems have not always been completely developed prior to the delivery of airplanes. Bad system design or installation can ruin an otherwise good airplane. Each operating system must be designed and developed by tests just as carefully and completely as the airframe structure.

There is general realization that a serious problem exists and some of the procedures outlined here can provide effective action in seeking a solution.

Ghost Approved

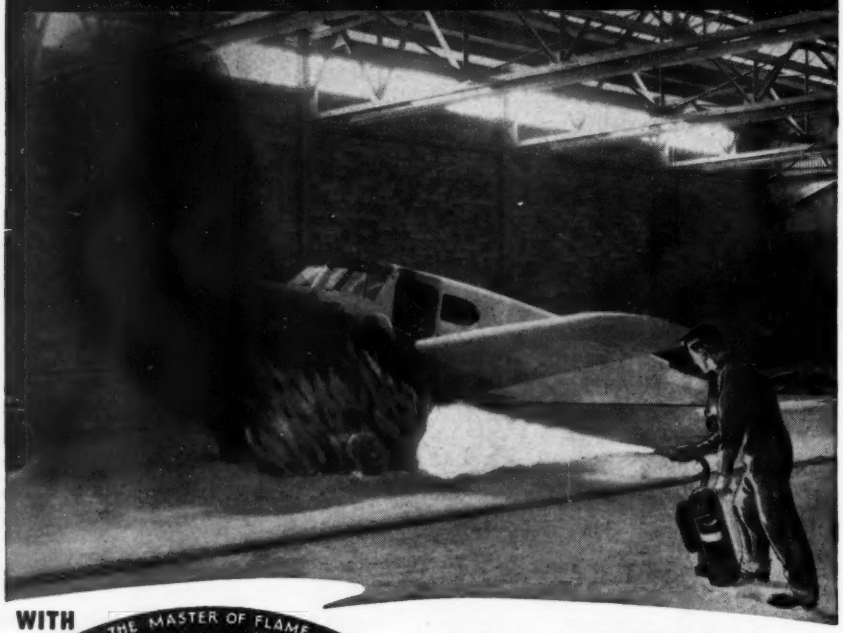
(*McGraw-Hill World News*)

LONDON—De Havilland Ghost jet engine which is expected to revolutionize British civil aviation has been officially approved by the Air Registration Board for use in civil transport aircraft.

The "Ghost" has been licensed for 3600 lb. thrust. But in its final state it will deliver 8000 lb. It will power the new de Havilland Comet airliner now being developed at Hartfordshire airfield for 500-mph. service across the North Atlantic and other routes.

The Comet will have four Ghost jet engines. It is expected to make its first flight in 1950 and to make the crossing from London to New York, nonstop, in five and a half hours. The "Ghost" engine is a development of the wartime "Goblin" used in British fighter aircraft. One of these new engines was installed recently in a de Havilland Vampire which broke the international altitude record.

STOP FIRE FASTER!



WITH THE MASTER OF FLAME ANSUL FIRE EXTINGUISHING EQUIPMENT DRY CHEMICAL FIRE EXTINGUISHERS

MORE FIRE-STOPPING POWER . . . FOR EVERY DOLLAR INVESTED

Ansul Dry Chemical Fire Extinguishers give you more protection . . . pound for pound . . . dollar for dollar . . . than any other extinguisher of comparable size. In addition . . . Ansul Fire Extinguishers provide the best first-aid protection:

- **For hazards involving gasoline and other flammable liquids, paints, oils and greases.**
- **For fires in live electrical wiring and equipment.**

Ansul Fire Extinguishers have the highest established ratings for effectiveness on flammable liquid fires, based on tests by nationally recognized approval agencies. The longer range stream of dry chemical is effective in winds and drafts.

After use, Ansul Dry Chemical Fire Extinguishers can be recharged "on the spot" . . . providing continuing protection . . . and annual recharging of Ansul extinguishers is not necessary.

Safe to use . . . non-toxic, non-corrosive, non-abrasive.

Ansul Dry Chemical Fire Extinguishers are preferred fire protection in the Aviation field.

Ask for your copy of file No. 218. You will receive factual data on how Ansul Dry Chemical Fire Extinguishers will cut your fire protection costs.

Listed and approved by Underwriters' Laboratories and Factory Mutual Laboratories.

ANSUL CHEMICAL COMPANY
FIRE EXTINGUISHER DIVISION, MARINETTE, WISCONSIN
DISTRIBUTORS IN ALL PRINCIPAL CITIES

New Plexiglas II Resists Higher Heat

During World War II, a Plexiglas canopy capable of withstanding service temperature up to 140 deg. F. proved ample for U. S. service aircraft. But when rapid postwar aircraft development accelerated and high-speed aircraft became a reality, it became necessary to provide aircraft blisters and canopies with a covering possessing high heat distortion resistance and ability to combat increased friction temperatures.

Rohm and Haas Co., Philadelphia, manufacturers of Plexiglas and Plexiglas products already had one answer in Plexiglas II, a heat resistant acrylic originally developed in 1939 for light piping in surgical instruments which were to be sterilized.

Most important characteristic of Plexiglas II, already installed on the McDonnell Phantoms and Banshees and approved for the Curtiss-Wright F-87, is its ability to withstand service temperatures 36 deg. F. higher than regular Plexiglas. In addition, sanding, sawing, routing and polishing operations are easier with the new Plexiglas II since its higher heat resistance makes it less sensitive to overheating during these operations.

Regular forming operations are used for the new Plexiglas, with the exception that forming ovens are operated 36 deg. F. hotter than for the other material. Parts which are to be drape formed or on which mark-off is a serious consideration are heated in a somewhat cooler oven than one used to draw Plexiglas II into long sheets.

Using these higher forming temperatures, it is necessary to work Plexiglas II more rapidly in order to complete the forming before the material becomes too cool.

The new Plexiglas has a tensile strength of 9000 psi., compared with a tensile strength of 8000 psi. for regular Plexiglas. In addition Plexiglas II has a heat distortion temperature (computed at 2 degrees Centigrade/min. at 264 psi.) of 100 degrees C., compared to 76 degrees C. for regular Plexiglas.

Research Expansion

The Texas Co. has started a 40 percent increase in its research laboratory facility at Beacon, N. Y. A new engineering building will contain laboratories for volatility, lubrication and combustion studies. A chemistry building will contain 18 entire laboratories for the development of new lubricants. A third new building will provide office space.

Five More Officials Quit at Convair

Changes in top administrative personnel at Consolidated Vultee Aircraft Corp., continue with the following recent resignations: Frank A. Learman, manager of the San Diego division; David G. Fleet (son of Convair founder Reuben H. Fleet), assistant to the division manager; B. W. Sheahan, chief division engineer; H. S. Martin, quality manager and J. L. Kelly, formerly San Diego division manager.

President Lamotte T. Cohu announced the appointment of Frank H. Harrison as assistant general manager in charge of production at the San Diego Division. Harrison was vice president—manufacturing of Curtiss-Wright during the war.

▶ In other personnel actions:

B. F. Goodrich Co., Akron, named Henry J. Zimmerman, general traffic manager of the firm since 1921, as assistant to the vice president, assigned to special administrative duties. Richard W. Corns succeeds him as general traffic manager.

Airborne Accessories Corp., Hillside, N. J., appointed Timothy F. Donovan as chief engineer. Previously he was chief electrical engineer for Air Associates, Inc.

Hamilton Standard Propellers division, United Aircraft Corp., East Hartford, Conn. has named William E. Diefenderfer and Edward Mosehauer chief design engineers. Diefenderfer will direct work on hubs and associated equipment while Mosehauer will direct design activity in the development of new high-speed blades.

Tinnerman Products, Inc., Cleveland, appointed Robert D. Williams personnel manager.

Sailors Aircraft Service, Inc., New York, named Everett H. Schroeder vice president. Schroeder formerly was service manager of the Atlantic division of Pacific Airmotive Corp.

Lear, Inc., Grand Rapids, Mich., named D. W. Haven as comptroller. Haven previously was assistant treasurer of Solar Aircraft Co.

General Motors, N. Y., elected E. B. Newill a vice president of General Motors Corp. Newill was general manager of the Allison division.

De Laval Steam Turbine Co., Trenton, N. J., announced the retirement of H. L. Watson as president after 35 years' service. George W. Smith, Jr., succeeds him.

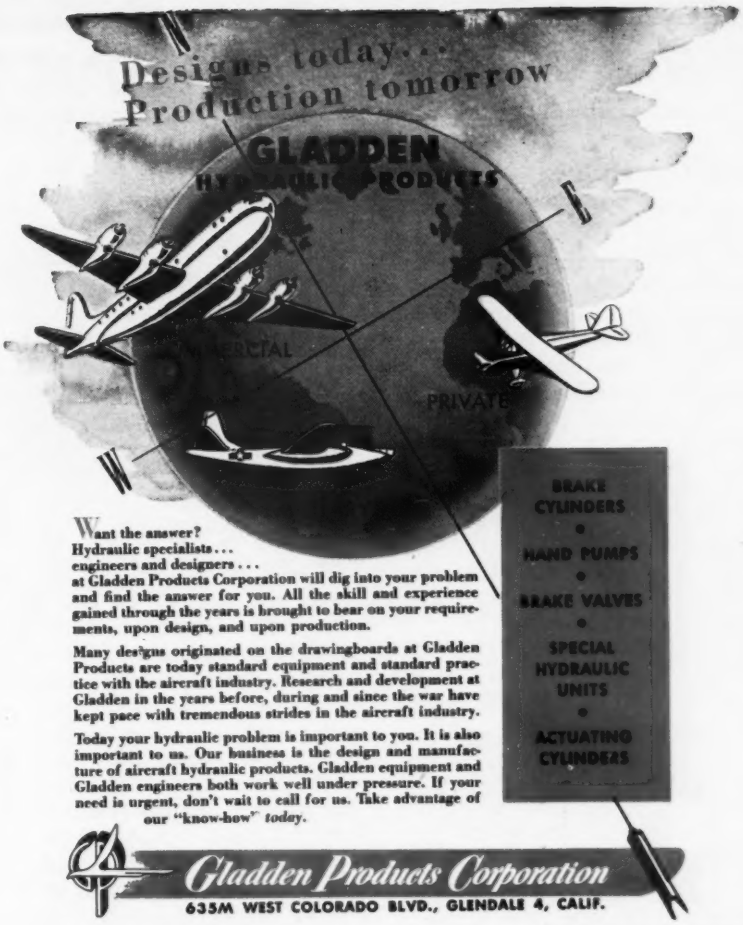
Piasecki Helicopter Corp., Morton, Pa., appointed Walter W. Bishop head of the company's industrial relation activities. Bishop was wartime personnel director of Wright Aeronautical Corp.

Ansul Chemical Co., Marinette, Wis., named William R. Rinelli director of its newly created customer relations department. Prior to this, Rinelli managed Ansul's development division.

Delta Uniform Co., N. Y., announced that Howard A. Zeimer, previously sales manager with Russell Uniform Co., has joined the company.

Monsanto (Canada) Ltd., Montreal, will be headed by Arnold H. Smith who was elected president of the company at a Monsanto meeting in St. Louis. L. E. Ryan was elected first vice president of the Canadian company.

General Electric Co., Schenectady, appointed Harold F. Smiddy general manager of the chemical department. Company also named Raymond G. Schieless a buyer for the resin and insulation materials division. George P. Lehmann, former manager of the company's plastics division, was appointed to the personal staff of Dr. Zay Jeffries, GE vice president. Robert L. Gibson succeeds Lehmann.



Want the answer? Hydraulic specialists . . . engineers and designers . . . at Gladden Products Corporation will dig into your problem and find the answer for you. All the skill and experience gained through the years is brought to bear on your requirements, upon design, and upon production.

Many designs originated on the drawingboards at Gladden Products are today standard equipment and standard practice with the aircraft industry. Research and development at Gladden in the years before, during and since the war have kept pace with tremendous strides in the aircraft industry.

Today your hydraulic problem is important to you. It is also important to us. Our business is the design and manufacture of aircraft hydraulic products. Gladden equipment and Gladden engineers both work well under pressure. If your need is urgent, don't wait to call for us. Take advantage of our "know-how" *today.*

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AMMUNITION BOXES & CHUTES
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WITH over 25 years of experience, the name Lavelle stands for engineering skill and precision in the manufacture of stainless steel and aluminum alloy products requiring the application of technical knowledge exacting control, and highly trained personnel.

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EXPERIENCE + PRECISION FOR *Aircraft, Airlines, Electronic Manufacturers*

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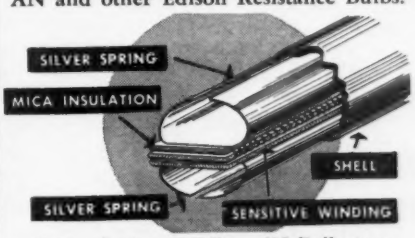
EDISON
Thermometer Bulbs

Better Than AN Specs
AT NO EXTRA COST!

Edison AN Thermometer Bulbs are now being manufactured in quantity by the Instrument Division of Thomas A. Edison, Incorporated, and are stocked for immediate delivery at competitive prices to meet your replacement needs. Exclusive design features provide faster response and permit higher operating temperatures than required by AN specifications.

Write for new bulletin and price list on AN and other Edison Resistance Bulbs.



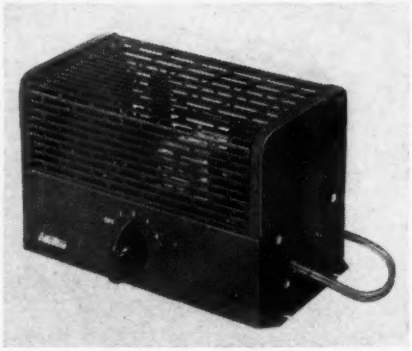
Cutaway view of Edison AN Bulb stem, showing exclusive patented silver spring design that provides faster response than required by AN specs, and excellent cushioning against shock.

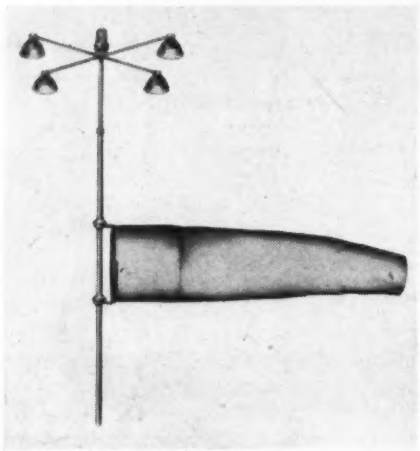
INSTRUMENT DIVISION
THOMAS A. EDISON, Incorporated
120 Lakeside Avenue • West Orange, New Jersey

NEW AVIATION PRODUCTS

Welder-Tip Holder

Water cooled ejector type holder for spot welder tip is offered by **Ampco Metal Inc.**, Milwaukee, Wisc. Features include: leak-proof and easily replaceable rubber water seal; impact-resistant aluminum-bronze head; stainless steel ejector sleeve; and water connections set at angle with sufficient clearance to permit use of shut-off coupling or extra heavy hose.



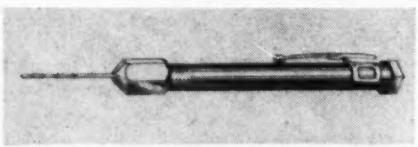


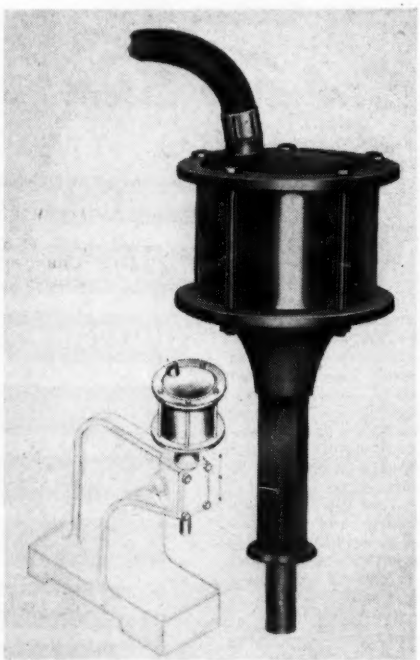
For Acoustic Problems

To increase power volume needed for adequate coverage of large or noisy manufacturing areas, booster amplifiers have been designed by **Executone, Inc.**, 415 Lexington Ave., N. Y. C., for use with company's intercom and sound systems. Operating on 110-120v., a.c. or d.c., amplifiers yield output of 8w. and consume maximum of 53w. Housed in metal cabinet, units are 5¼ in. high, 4½ in. deep and 8⅞ in. long. Combination four-step control and on-off switch regulates volume to desired level.

Wind Cone

New type wind cone for large airports, conforming to AN-CAA specifications, is announced by **Westinghouse Electric Corp.**, 306 Fourth Ave., Box 1017, Pittsburgh 30, Pa. Unit has 36-in. sock, 12 ft. long for high visibility and accurate response. Sealed-in ball bearings are intended to give positive indication with lightest breeze. Cones are available for beacon-tower or pipe mounting as required.





Cleans Welding Tips

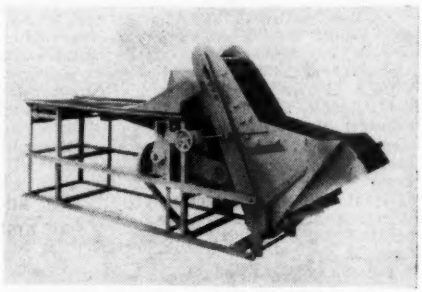
New pencil-type tip drill kit, made by **J. M. Ragle Industries**, Kansas City, Mo., is designed with clip so that it can be carried in pocket. The carbon steel drill of the unit is claimed to recondition a welding tip in matter of minutes. End is tempered steel double-end chuck holding drill sizes 45-80. Handle holds 24 different size drills; and 12 assorted drills, in even number sizes 52-74 inclusive, are supplied.

Converts Arbor Press

Air conversion unit designed to convert hand-operated arbor presses into air presses, is offered by **Paragon Metal Products**, 844 West Adams St., Chicago, Ill. Device can be quickly installed by removing ram and retainer plate from old press, placing unit into ram seat, replacing plate and connecting unit to shop air line. Models are made to fit presses having various size and shape rams. By utilizing body of old press, unit obviates necessity of retooling. Device has 4 in. i.d. cylinder, 2½-in. stroke, ¾-in. ram and power factor 12.5 times line pressure.

Radio Noise Suppression

Interference filter selector, offered by **Aerovox Corp.**, New Bedford, Mass., is contained in metal cabinet with hinged-cover compartment holding assortment of connecting cords, plugs, receptacles and clips. After connection to noise-producing appliance, knob of unit is turned through series of different settings, each bringing into circuit the elements found in company's interference filters of corresponding type numbers. This is stated to make known type of filter to use, as well as best connections.



Inspection Table

Applicable to production phases of aircraft industry is new inspection table designed for small parts, such as nuts, bolts, etc. Maker is **D. H. Prutton Machinery & Tool Co.**, 5295 West 130 St., Cleveland, Ohio. Elevator-hopper feeds parts onto 2 x 8 ft. conveyor belt for visual inspection. Multi-speed transmission and variable angle control allows any desired distribution on table. It is claimed that it is possible to inspect as many as 130,000 small pieces per hr. Table requires 48 sq. ft. of floor space and is built so that all moving parts are readily accessible.

Battery Hookup

New B-319 battery terminal connection is marketed by **James A. Stanley Co.**, 277 Broadway, N. Y. C. Unit is designed to avoid loosening of battery post or breaking top of battery cell on removal. Pliers is only tool needed to install or remove device. Spring pressure (122 lb.) is intended to keep connection tight regardless of shock or vibration.

FINANCIAL

Trusts Active in Aviation Shares

Conflicting gains and losses indicate difficulties in foreseeing profitable industry investment trends.

Investment trusts appear to have been unusually active in shifting aviation holdings during the first six months of this year.

Significant adjustments are evident in the account of National Aviation Corp., a trust completely devoted to aviation shares. Total assets of this company aggregated $7,759,823 as of June 30, 1948, as contrasted to $8,186,858 a year earlier, indicating a slight evaporation in value of portfolio holdings as contrasted to the price increase in general securities.

Aircraft and accessory issues were increased to 39.7 percent of total resources at June 30, 1948, as compared to only 18.5 percent on June 30, 1947. This was accomplished by reducing participation in airlines from 43 to 31.7 percent and by reducing cash resources from 38.5 to 28.6 percent.

It is noteworthy that among the additional shares acquired during the first half of this year were 10,000 shares of Curtiss-Wright common and 5000 of the Class "A" stock. A director of National Aviation serves in a similar capacity with Curtiss-Wright. However, the Curtiss-Wright shares appear to have been acquired early this year well in advance of recent special dividend declarations by the aircraft company. Other profitable purchases include 4900 shares of Grumman and 2000 Bendix. Further additions were 5500 North American Aviation, 2000 Sperry and 2500 United Aircraft common.

► **Liquidations Listed**—Liquidations in the aircraft group were represented by 1500 Bell, 4300 Boeing, 800 Douglas, 1000 Lockheed, 1000 Thompson Products and 700 United Aircraft preferred.

In the airline group, liquidations outweighed purchases. Liquidated were the entire holdings of 9500 shares of National and 5000 United. A total of 2300 shares of American preferred and 7500 Northwest preferred also was sold. Added to previous holdings were 2000 Braniff, 500 Delta and $35,000 Capital debentures.

Giving effect to these shifts during the first half, National Aviation's portfolio as of June 30, 1948, consisted of the following:

21,000 Bell, 2,000 Bendix, 6,500 Boeing, 10,000 Curtiss-Wright common, 5,000 Curtiss-Wright "A," 5,700 Douglas, 19,000 Grumman, 9,000 Lockheed, 19,000 North American, 2,000 Sperry, 7,000 Thompson Products, 11,500 United Aircraft Common, 2,500 United Aircraft Preferred, 10,000 Air Express International Common, 1,000 Air Express International Warrants, 10,900 American preferred, 10,000 Braniff, 5,000 Chicago & Southern Common, 2,500 Chicago & Southern voting trust certificates, 10,500 Delta, 40,000 Eastern, 11,100 Northwest Preferred, 385,000 Capital Debentures, 5,010 United Preferred.

► **Aircrafts, Airlines Contrast**—Among the aircrafts, only Douglas and Sperry showed a current loss, having an average cost above the prevailing market prices. In the airline group, however, almost the opposite condition existed. Only purchases of Eastern and Braniff remained above water and showed a profit over cost.

Other specialized aviation trusts also were very active. Aviation Shares of Group Securities, Inc., a $3,500,000 fund, discloses a number of interesting trades. This fund's holdings as of May 31, 1948, together with the purchases and sales of the previous six months (indicated in parentheses) were as follows:

17,000 (3500) American Airlines, 6,000 (2800) Beech Aircraft, 2,700 (—1300) Bell Aircraft, 5,200 (—1300) Boeing, 11,000 (4500) Braniff, 4500 (—4100) Cessna, 12,000 (5000) Convair, 7,500 (1500) Curtiss-Wright "A", 4,000 (No Change) Douglas, 3,500 (—2300) Eastern, 800 (No Change) Eaton Mfg., 2,500 (—7,500) Fairchild Camera, 10,000 (6000) Fairchild Engine, 4,500 (No Change) Grumman, 2,800 (No Change) Irving Air Chute, 12,000 (2100) Lockheed, 13,000 (6300) National Air, 13,000 (2200) North American, 9,500 (4500) Northwest, 15,000 (7000) Pan American Airways, 21,600 (No Change) Piper Aircraft, 10,000 (1000) Republic Aviation, 7,000 (No Change) Solar Aircraft, 9,000 (600) Sperry, 9,000 (1500) United Aircraft, 8,500 (4000) United Airlines.

► **No Pattern**—It is difficult to detect any consistent pattern in the above shifts during the previous six months. It was particularly costly, for instance, to sell a large block of Fairchild Camera, presumably prior to its sensational price appreciation.

Still another aviation trust is represented by Aviation Group Shares of Institutional Shares, Ltd., with total assets in excess of $1 million. Similarly, total holdings as of May 31, 1948, are shown as follows:

8,900 American Airlines, 500 Bendix Aviation, 3,200 Boeing, 900 Capital Airlines, 3,100 Convair, 1,400 Douglas, 5,300 Eastern Airlines, 2,800 Fairchild Engine, 1,600 Grumman, 3,600 Lockheed, 2,000 Martin, 4,700 North American, 3,400 Northrup, 1,700 Northwest Airlines, 2,600 Pan American, 4,900 Republic Aviation, 1,600 Sperry, 1,400 TWA, 3,300 United Aircraft, 2,700 United Airlines.

While there was a series of adjustments, buying and selling, during the previous six month period, they were relatively insignificant in effect. Evident purpose of this aviation fund is to seek broad diversification with apparently little effort advanced toward selectivity.

► **Trusts Active**—A number of the general investment trusts appear to have been active in aviation shares. They disclose differing results.

Fundamental Investors, a $30 million fund, shows the following aviation holdings as of June 30, 1948: 20,000 Grumman, 30,000 North American, 2000 Douglas and 16,000 United Aircraft. A total of 1000 Boeing were sold the previous quarter and the Douglas and North American shares acquired during the same period. Ownership of Grumman worked as a decided advantage to Fundamental during this period.

The usually well-managed Lehman Corp., a leading investment trust with total assets in excess of $65 million, appears to have been ill-advised in handling its aviation commitments. During 1947, substantial positions were built up in various airline equities at prices believed to be materially above current levels. Such commitments were represented by 36,000 American, 18,750 American Overseas, 29,000 United Airlines, 10,000 Eastern and 6500 Pan American. An investment in 5000 shares of Sperry represented the closest approach to the aircraft industry. During the past year, selected aircraft shares have performed exceptionally well. Yet at no time during this stage did the Lehman Corp. have any investment in this group.

During the second quarter of 1948, Lehman appears to have started to reduce its airline holdings by selling 5000 shares of American and 8000 of United, presumably at a material loss.

► **Large Holder**—The Tri-Continental group (Tri-Continental, Capital Administration and Selected Industries) continues as large holders of airline shares. As of June 30, 1948, the group's investments included 36,900 shares of Eastern, 34,000 of American, 6100 of United and 3300 Northwest preferred.

The conflicting courses followed by a broad list of general investment trusts examined discloses that this group has had considerable difficulty in discerning profitable investment trends within the aviation groups. Further, there is little doubt that general support of aviation shares by the trusts is currently lacking and may be responsible for a void that could have considerable market influence. **—Selig Altschul**

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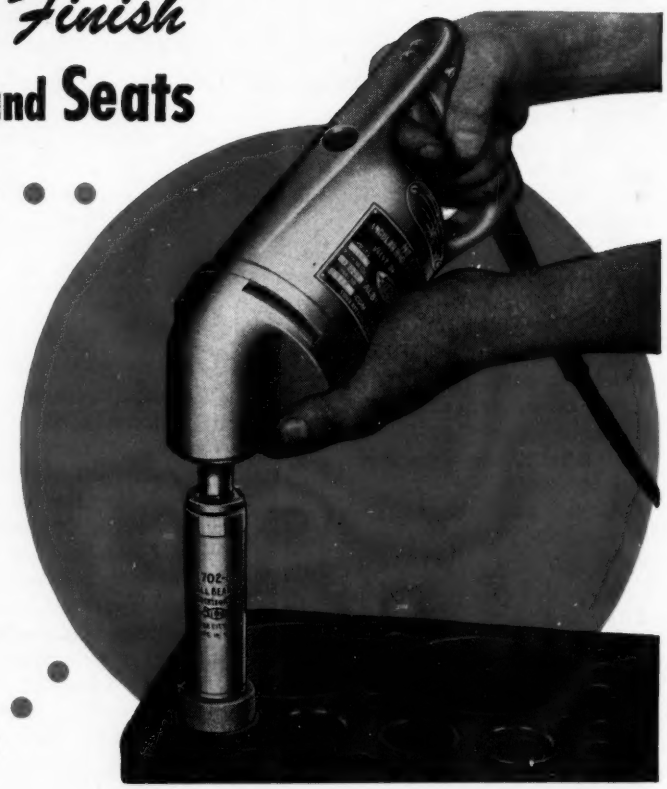

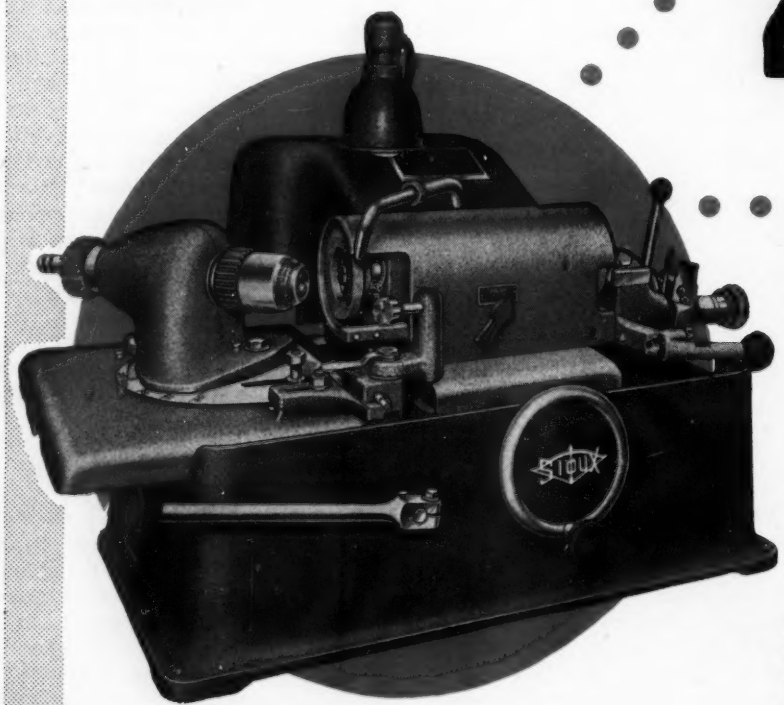

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New Air Taxi Service Organized

Fixed base operators set up feederline network to link small communities with large air terminals.

By Alexander McSurely

An air taxi network organized among fixed base operators who are members of the National Aviation Trades Association, already has enrolled 432 operators and is expected to grow eventually to around 1000 operators.

Harry Meixell, NATA executive director, said the new air taxi project was organized after planning conferences between NATA and Air Transport Association, to provide standardized dependable air taxi service to off-airline communities from major airline terminal points.

► **Operators Listed**—First directory of the NATA air taxi system now being printed and due to be issued Sept. 1, lists 432 operators who have enrolled and who represent 347 communities, in 26 states and the District of Columbia. The area has a total population of 95,000,000.

In addition to providing a feeder service for the airlines, the NATA air taxis will provide emergency air service and service between off-airline points as the individual operators have, heretofore.

Airlines and other trunkline transportation agencies will be able to use the directory to make advance arrangements for air transportation for passengers beyond their terminal points. In reciprocity, Meixell expects that the individual taxi operators will be able to feed additional requests for reservations to the airlines.

It will make available better transportation for some communities which now have only very limited rail or bus facilities but which are potential sources of airline traffic, he points out.

► **Insurance, Too**—Plans are being developed for a combination ticket and insurance policy, covering the passenger while he is riding in the air taxi. Meixell has beein conferring with several insurance underwriters on this part of the program. It is pointed out that many insurance policies cover the holders only when they are riding in scheduled airlines. The combination air taxi ticket and insurance would remedy this drawback, with trip insurance available in varying amounts for the passenger's selection.

Significant is the fact that only four of the 432 operators who have signed are in the large operator category, which uses any airplanes of 10,000 lb. gross weight or more, or more than four airplanes weighing 6000 lb. gross each in the projected service.

This indicates that the vast majority of the taxi operators are not likely potential competitors with the major scheduled airlines, but are small business operators and presumably will remain such.

All the taxi operators listed are NATA state chapter members who hold valid operating certificates under CAR Part 42 and letters of registration under revised Section 292.1 of the CAB's Economic Regulations authorizing operation as non-certificated irregular air carriers.

► **More Directories**—Printing forms have closed for the first directory, but directories will be published quarterly, beginning in January, and subsequent editions are expected to include larger lists, eventually reaching approximately 1000 taxi services, Meixell reports.

Directories will be distributed by the taxi operators and through the scheduled airlines, with each directory bearing a detailed statement about the local service. Meixell has prepared a rubber stamp with a statement about the mythical ABC Air Taxi Service, as a model for member operators.

► **Combs Committee**—A seven-member air taxi committee with a member from each of NATA's seven regions will be headed by Harry Combs, Denver NATA vice president-transportation. This committee will be charged with developing a code of standardized operating practices and ethics for the air taxi system and will serve as a clearing house for grievances from the public and between operators.

Meixell expects that a considerable volume of additional business will be generated by cooperation between taxi operators in different localities who can arrange return loads for each other and refer business which they may not be able to handle to other taxi services in the system.

► **Rates Sidestepped**—Problem of standardized rates is something that the NATA plan is sidestepping at least for the present. Any question of uniform rates in the system would immediately make it liable to further economic regulation by CAB, which is felt to be premature at least in the organization state of the new system.

SALES RATE: $8000 AN HOUR

What is perhaps a new high in fast-paced selling was rung up by John Cunningham of Cannon Aircraft Sales, Charlotte, N. C., when he booked orders for three Cessna 195s within a space of five hours on June 21. All the sales were to different customers. Interesting feature of the sales is the 195 selling price: $13,750 for each of the Cessnas or $41,250 worth of business for the three of them in five hours.

A letter from M. F. Redfern, ATA vice president and secretary, to NATA has outlined suggested requirements of such a system:

- Definite safety standards.
- Minimum insurance protection for passengers.
- Standards of service including charges.
- Current directory of operators participating, including equipment types, area served etc.
- Expeditious handling of reservations, cancellations and refunds.
- Protection of passengers for failure of performance.
- Promotion and advertisement of the plan by air carriers and fixed base operators.

At the recent California Aviation Trades Association meeting, Richard Thurber, executive director of CATA, told delegates that the proposed taxi operation would tap a new market both for airlines and for charter operators reaching many prospective passengers who are too remote from airline terminals to get full benefits from airline travel, without such a supplementary service.

"The so-called feeder lines actually are airlines," Thurber said. "Ours will be the real feeders."

Bonanza Sells Autos

Oberlin Motor Co., Oberlin, Kans., has a Beech Bonanza it claims is as good as any salesman on the company's staff.

The red and ivory craft currently is being used to ferry Jack and Albert Dryden to the automobile factory, and to fly customers to the Detroit factory to take delivery on their newly-purchased automobiles.

Rx: Mix Two Children, One Plane, Whooping Cough

Extreme versatility of the airplane was demonstrated recently by the fact that a doctor's prescription in McKinney, Tex., read in effect: one airplane ride.

The doctor recommended that two children suffering from whooping cough be taken up to 10,000 feet for about fifteen minutes.

J. O. Womack, of Mustang Airport, Dallas, played pharmacist and loaded the children and their father in his Cessna. H. O. Wright flew them over Dallas.

Back in McKinney, the father said that the children were both decidedly improved.

CAA Reports On Civil Aircraft

Civil aircraft increase of almost 15,000 over last year is recorded by the Civil Aeronautics Administration in its July statistical report.

Number of civil aircraft in the United States on July 1 was 96,330, compared with approximately 83,000 on the same date last year.

Civil aircraft production for May totaled 812, compared with 1646 for May, 1947.

► **Certificate Decrease** – Approved certificates for student and private pilots showed a marked decrease. In May, 1948, 14,839 student pilot certificates were approved, compared with 18,793 for May, 1947. CAA approved 7929 private pilot certificates in May, 1948, against 9776 in May, 1947.

WHITAKER'S TANDEM WHEELS

Art Whitaker, Portland, Ore., aircraft service operator, has developed this tandem wheeled landing gear on a Piper PA-11 for improved lightplane performance on rough fields. Two wheels of the same size are mounted on each of the main landing gear legs, with a hinge attachment to the original axles. Brakes are on rear wheels. Whitaker has been flight testing the device in landings and takeoffs for 40 hr. and is seeking CAA approval. Takeoff and landing demonstrations have shown the gear makes possible: a straight roll in either landing or takeoff without use of rudder; a wheel landing or conventional landing with brakes locked without tendency to nose over; safe landings in muddy and plowed fields; stiff crosswind landings in which the plane goes into a wide turn rather than ground looping.

Civil Aircraft Tally

Airports recorded with CAA (July 1)	6210
Civil Airports	5789
Class I and under	3901
Class II	901
Class III	440
Class IV	351
Class V	123
Class VI and over	73
Scheduled Air Carrier Aircraft (July 1)	1023
Total U. S. Civil Aircraft (June 1)	96,330

Civil Aircraft by States

Alabama	1002
Arizona	1237
Arkansas	1148
California	10560
Colorado	1363
Connecticut	721
Delaware	233
District of Columbia	905
Florida	2964
Georgia	1535
Idaho	800
Illinois	4662
Indiana	2759
Iowa	2330
Kansas	3064
Kentucky	877
Louisiana	1059
Maine	644
Maryland	1138
Massachusetts	1458
Michigan	4726
Minnesota	2118
Mississippi	718
Missouri	2446
Montana	942
Nebraska	1665
New Hampshire	320
Nevada	428
New Jersey	1663
New Mexico	813
New York	4841
North Carolina	1844
North Dakota	940
Ohio	4681
Oklahoma	2473
Oregon	1756
Pennsylvania	4506
Rhode Island	205
South Carolina	833
South Dakota	819
Tennessee	1312
Texas	8142
Utah	547
Vermont	198
Virginia	1484
Washington	2174
West Virginia	674
Wisconsin	2136
Wyoming	467

Federal Airport Grants Total 389

Fifty-eight local sponsors under the Federal Airport Aid Program received $9,016,861 in Federal funds from June 15-July 15, bringing the overall number of grants to 389 airports for a total of $45,229,007.

Largest single grant during the June 15-July 15 period was $817,549 to Baltimore, Md., for construction work on Friendship Airport.

Latest Civil Aeronautics Administration tabulation on the overall progress of the airport program shows 29 projects 100 percent completed against 13 the previous month. Fifty projects are between 66-99 percent completed against 39 the previous month.

▶ **Classification**—Of the 389 grant offers to date, 108 are for construction or improvement of Class I airports; 95 for class II fields; 110 for Class III fields and 76 for the building or development of Class IV, large terminal-type airports.

A total of 687 local airport sponsors are known to have matching funds 100 percent available.

Other large grants during the same period include Rochester (N. Y.) Airport, $780,000; Lovell Field, Chattanooga, Tenn., $714,580; Atlanta (Ga.) Municipal Airport, $706,994.

Trade Group Officers

Robert S. Northington, vice president of Piedmont Aviation, Inc., Winston-Salem, N. C., was elected president of the North Carolina Aviation Trades Association at a recent meeting at Raleigh. Other officers named were: Clay Swaim of Salisbury (N. C.) Aircraft Service, vice president, and Sib Law of Fayetteville (N. C.) Air Service, secretary-treasurer.

The all-day session included a discussion on G. I. flight training led by Harry Meixell, National Aviation Trades Association executive director, and other talks by Beverly Howard, NATA president, and Tom Davis, president of Piedmont Aviation, Inc., and retiring board chairman of the North Carolina operators group. John Terrell of Cannon Aviation, Inc., Hickory, N. C., is retiring president, and succeeds Davis as board chairman.

Airport Aid Urged

Congress was petitioned by the American Roadbuilders Association to appropriate the full $100,000,000 annual expenditure for Federal aid to airport development authorized by the Federal Airport Act in a resolution at the ARA annual convention in Chicago, July 16-24.

BRIEFING FOR DEALERS & DISTRIBUTORS

PRODUCTION CROSSWIND GEAR—Goodyear Tire & Rubber Co. has shipped its first production crosswind wheels for light airplanes to Cessna Airplane Co. at Wichita, Bob Richardson, manager of the Aviation products division has announced.

The shipment was made almost simultaneously with the presentation at Idlewild Airport of a CAA-approved type certificate for the larger Goodyear crosswind wheel installation on a Douglas DC-3. The certificate was received by T. A. Knowles, vice president and general manager of Goodyear Aircraft Corp., from H. Lloyd Child, assistant to the CAA administrator who has been in charge of the crosswind gear development for CAA.

Cessna has announced list prices of $340 for factory installation of the crosswind gear on new air planes, and $430 for changeover in the field. Articles shipped to Cessna contain the castering mechanism within the hub of 6.00 by 6 size airplane wheels. The installation for the DC-3 contains a similar but larger mechanism in the hub of a 17.00 by 16 size wheel hub. Goodyear anticipates that other lightplane manufacturers will soon announce availability of crosswind wheels as optional equipment on their planes.

VETERANS' AFFIDAVITS—New Jersey Aviation Trades Association is collecting affidavits from veterans who are being "discouraged" by the Veterans' Administration from taking flight training. NJATA officials charge that "vocational guidance" experts at VA are steering would-be aviation pupils away from flight courses, asserting that the aviation business is overcrowded, in opposition to the intent expressed by Congress to allow veterans to elect courses of their own choosing, including vocational flight training. Affidavits may be used as ammunition in legal proceedings to restrain VA's "discouragement" tactics.

BIPLANE GOODYEAR ENTRY—Out at Dahio Airport near Dayton, James Dickson, mechanic at the airport, is assembling a biplane entry for the Goodyear trophy midget plane races at Cleveland Municipal Airport on Labor Day week end. Plane will have a 15-ft. span top wing and 13-ft. lower wing.

Dickson expects to get sharper pylon turns with the biplane than his monoplane competitors, and his calculations show the planes should do between 175 mph. and 200 mph. After running taxi tests at Dahio Airport early in August, he will make his first flight tests at Richmond, Ind., airport.

McCauley Propeller Corp., also of Dayton, is designing a special propeller for the Dickson entry, which, like all the other 100 planes being groomed for the midget competition, will use an 85-hp. Continental engine.

TRAINING DECLINE REFLECTED—A total of 14,839 student pilot certificates issued by CAA in May, 1948, showed a marked decline from the 18,793 issued in the same month in 1947. Corresponding declines were shown in private pilot certificates, to 7929 from 9776, mechanics certificates, to 764 from 1290, flight instructor ratings, to 423 from 769, and instrument ratings, to 146 from 257. Only increase was in commercial pilot certificates which moved up to 764 for May, 1948, as compared to 627 for May, 1947.

OHIO FARMER PROGRAM—Ohio Association of Flying Farmers meeting recently at Columbus drafted a ten-point program calling for state financing for landing strips for all communities, through a special aviation fund to be created by the Ohio General Assembly. Revenue for the fund is to be derived from aviation gasoline tax, and the program calls for a licensing fee similar to that for auto licenses to be substituted for personal property tax on airplanes which is the present Ohio practice.

TAYLORCRAFT DELIVERY FLIGHTS—L. W. (Roy) Hubert, Vancouver, Wash., airplane distributor, took delivery of the first 1949 Taylorcraft Model 85 recently at Alliance and flew it back to Vancouver, along with a 1949 Taylorcraft de luxe 65, flown by an associate. Hubert tood delivery on the first 40-hp. Taylorcraft Model A in 1937 and flew it back to Vancouver. Second Model 85 was taken by C. W. Millard of Toronto, Ontario.

—ALEXANDER McSURELY

Plane Development Bill Fought

Manufacturers, fearing extensive damage to sales hopes for present transport types, seek to amend or delay measure.

Economy-minded Senators and cautious aircraft manufacturers formed a last-minute battle-line of opposition to legislation authorizing the government to finance developmental costs on commercial transport and cargo prototypes.

The Senate was all set to approve the bill at the special session. It previously had passed the House and survived hearings before a Senate committee. If the measure cleared the Senate quickly, planning could be done by the end of year and the new Congress convening in January could make appropriations to get the program going.

► **Future Uncertain**—But mounting opposition now has made the proposal future uncertain. However, Maine's GOP Sen. Owen Brewster, who headed the former Congressional Aviation Policy Board and sponsored the legislation, did not waver in his intention to push it through the special session.

In the ranks of those against the bill there was general agreement on the theoretical principle that the government should promote commercial air transport as an arm of national defense through Federal-aid stimulation of prototype development.

► **Opposition Forms**—Industry objection to the measure, led by Glenn L. Martin Co. and Consolidated Vultee, appeared to be motivated by the manufacturer's fears that the promise of super transport and cargo types in three to five years would cause airlines to forego purchases of types now on the market, including the Convair-Liner and Martin 2-0-2. Consolidated has estimated its total loss on 178 Convairs at $46,000,000. Developmental costs on the 2-0-2 caused serious financial difficulties for the Martin company. A Reconstruction Finance Corporation loan aided Martin.

An amendment opening the way for large-scale purchases of airliners now on the market as soon as the bill is enacted —and before prototypes have been developed under it—was proposed by Martin. The amendment would insert the clause, "and facilitate the purchase by airlines of existing types of aircraft" in a provision of the bill, making it read:

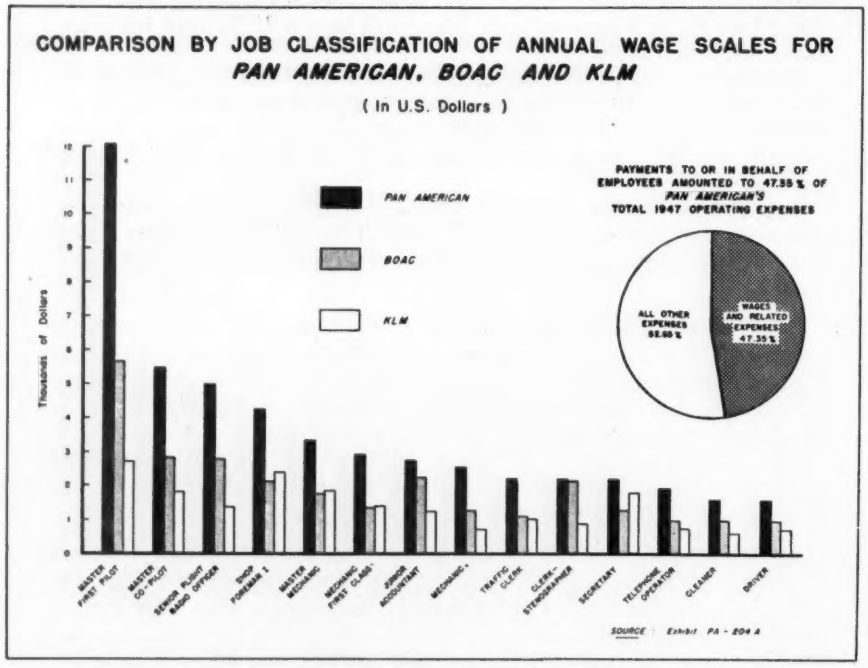
". . . It is hereby declared to be the policy of the Congress that in the interest of national security the Federal government should promote the employment in air commerce in as large numbers as possible of more efficient transport and cargo aircraft; and, to this end, sponsor design, development, testing, tooling, construction, service testing, and modification of prototype transport and cargo aircraft **and facilitate the purchase by airlines of existing types of aircraft**, intended primarily for commercial use, but adaptable also for auxiliary military service."

► **Pool Idea Rejected**—Brewster turned thumbs down on the Martin proposal, interpreting it as the aircraft "pool" idea—under which the Air Force would buy planes for a national defense reserve and lease or re-sell them to the airlines. This was put forth last year by the Air Transport Association in testimony before the President's Air Policy Commission. "Both the President's Commission and the Congressional Aviation Policy Board rejected the proposal, and we cannot expect Congress to adopt it," Brewster commented.

An amendment proposed by Consolidated Vultee would stipulate that the government only finance development of types not being built by private enterprise. "The bill is claimed necessary to give the U. S. jet transport types," Emmett McCabe, a Consolidated director commented. "We have asked that it specify that jet planes are to be developed under it."

► **AIA Fears Socialization** – Brewster brushed off manufacturers' anxiety that a government prototype development program would interfere with current transport sales, saying: "Types developed under it will not be ready for from three to five years. If existing types of transports have not been sold by then—they never will be."

In addition to Martin and Consolidated Vultee, there was increasing apprehension over the prototype bill in the ranks of the Aircraft Industries Association on the grounds that it is a major stride toward socialization of the industry. Manufacturers pointed out it would virtually wipe out private enterprise development of commercial aircraft and bring the industry under rigid government regulation.



PAA CONTRASTS PAY SCALES

Pan American Airways, which is fighting for domestic routes to strengthen its international operations, recently showed the Civil Aeronautics Board this chart to illustrate the lower costs of its foreign flag line competitors. Greatest wage differentials are reflected in higher bracket personnel, such as captains, first pilots and copilots. Master first pilots for PAA receive from $11,400 to $12,700 annually, while the comparable position with British government lines pays between $5000 and $6200 per year. PAA's first class mechanics are paid between $2700 and $3000, while simliar personnel employed by British and Dutch airlines receive between $1200 and $1600. In practically no personnel categories are wages paid by foreign flag carriers comparable to those paid by American operators.

► **Powers Defined**—Under the measure, the Secretary for Air is authorized to set the sales price on all planes subsequently manufactured from government-developed prototypes. The Secretary is also directed to work out a plan for recouping government developmental expenditures. This might mean, it is believed in some quarters, that when plane costs dropped materially through mass production, savings would revert to the Federal treasury. Manufacturers were reluctant to declare their opposition to the measure. This would mean a clash with the Air Transport Association, one of its leading advocates.

Senate opposition was led by Chairman Chan Gurney (R., S. Dak.) of the Armed Services Committee. He was backed by most of the members of his committee and by Sen. Harry Byrd, (D., Va.) and Sen. Leverett Saltonstall (R., Mass.). Sen. John Williams (R., Del.), who blocked passage of the Brewster bill at the regular session, remained opposed to it. Sen. Claude Pepper (D., Fla.), who also blocked passage (because he was not familiar with the measure's terms), has withdrawn his opposition.

► **Objections Cited**—Gurney objected that the measure "marks an innovation in government policy by providing for the use of military appropriations to financially assist private airlines" and "might mean the expenditure of hundreds of millions of dollars annually." He suggested that Brewster is "stretching the point" when he argues that development of aircraft to suit the commercial needs of airlines "is essential for national defense." He indicated satisfaction with the present policy of military development of transport craft for military needs.

Gurney emphasized that he is "not definitely opposed" to the principle of Federal aid for stimulation of commercial plane development, but that he felt "it is a far-reaching matter" and "should be carefully and thoroughly reviewed" by his Armed Services Committee before it is given a green light. He said he would seek delay in passage of a prototype measure until the convening of the new Congress in January.

► **Delay Supported**—Gurney's proposal for delay appeared to have general approval among aircraft manufacturers. Manufacturers in favor of the measure, but apprehensive about some of its stipulations, would have time to work out different language.

Delay until the new Congress would also mean that a prototype development program would probably not get underway before 1950. This, presumably would lessen the fears of Martin and Consolidated Vultee that the program will interfere with their immediate sales of Convairs and 2-0-2s.

Hawaiian Service Goes to NWA

Importance of linking Pacific Northwest to Hawaii is deciding factor in CAB award of new route.

Hawaii has attained new prominence as aerial crossroad of the Pacific Ocean area.

Another link between the island territory and the U. S. will be forged by Northwest Airlines, which has just received a five-year CAB certificate to operate from Seattle/Tacoma, Wash., and Portland, Ore., to Honolulu. Hawaii already has American flag air service to San Francisco via Pan American Airways and United Air Lines and to Los Angeles via PAA. Three foreign carriers—British Commonwealth Pacific Airlines, China National Aviation Corp. and Philippine Air Lines—also hold permits for trans-Pacific services to the U. S. via Honolulu.

► **Close Decision**—Selection of Northwest to operate the new service was by a tight two-to-one CAB decision which received President Truman's approval after a four-month delay. Board member Josh Lee and former member Harllee Branch concurred in the majority opinion, while Vice Chairman Oswald Ryan dissented. Board members Jones and O'Connell had not yet been appointed.

Ryan favored Pan American for the route. Other unsuccessful applicants were Matson Navigation Co. and Transocean Air Lines.

The CAB majority decided that Northwest could offer new one-carrier service to more potential traffic between the Pacific Northwest and Hawaii than any other applicant. The opinion pointed out that NWA would draw business directly from the north central and northeastern portions of the U. S. over its domestic routes.

► **Costs Compared**—Lee and Branch admitted that PAA might at first operate the new link at slightly less expense than Northwest. But they said the difference in net cost to the government was not significant. The majority declared that Matson and Transocean would require considerably more government mail pay assistance than either NWA or PAA.

CAB conceded the Pacific Northwest-Hawaii route probably would not be self-sufficient for a considerable period of time. It stated, however, that the new service, if fully exploited, can benefit U. S. commerce at a reasonable cost to the government.

Ryan contended that certification of Northwest for the Hawaiian link gave that carrier a stub-end extension into the central Pacific which bears no logical relation to the company's route to the Orient. He said that if the link were granted to Pan American it would become an integrated part of that carrier's system, supplying through service from the Pacific Northwest to Australasia in competition with British Commonwealth Pacific Airlines. PAA's dependence on government subsidy would be substantially less than Northwest's, according to Ryan.

► **Route Value Doubted**—Expressions of doubt that a Pacific Northwest-Hawaii air route should be authorized have come from several quarters. United Air Lines President W. A. Patterson has repeatedly taken a dim view of the link. And last summer a CAB examiner recommended against certificating the route because of high subsidies required and low traffic potential.

The examiner's report stirred hot protests from business and civic interests in the Northwest area. CAB, in authorizing the operation, estimated the annual traffic potential at between 6000 and 8000 passengers.

► **Traffic Growth**—Success of the UAL and PAA routes between California and Hawaii undoubtedly had considerable effect on CAB's decision to certificate Northwest. Growth of air traffic between the mainland and the territory has been so great that the continued existence of passenger steamship service is threatened.

Pan American Airways inaugurated U. S.-Hawaii service in 1937, carrying 296 passengers during the year—less than one percent of the 46,656 transported by steamer. During 1947, PAA and United together carried 69,762 passengers on the Hawaiian run, against only 26,000 for the steamship operators.

Pioneer Reports Profit

The first certificated U. S. air carrier to report financial results for the first half of 1948 edged into the black.

Pioneer Air Lines secretary-treasurer E. W. Bailey announced his company earned $5825 during the six months ended June 30. Sizable losses in January and February were more than offset by profits in March, April, May and June. PAL was one of the few carriers to show a profit in 1947.

Traffic during June was the best in company history. The line carried 8918 passengers, 57,427 lb. of mail, 16,584 lb. of express and 21,628 lb. of freight during the month. In June, 1947, Pioneer carried 5627 passengers. Activated in August, 1945, PAL was the nation's first certificated feeder.

East-West Nonskeds Talk Back

Three principal lines say they cannot operate if regularity of flights is limited too stringently by CAB.

Three of the principal transcontinental nonscheduled airlines that are under fire from their certificated competitors have invited a showdown with the Civil Aeronautics Board.

Standard Air Lines, Viking Air Lines and Airline Transport Carriers have asked CAB for temporary exemptions to engage in scheduled "coach-type" coast-to-coast operations pending a decision on their applications for certificates. If the Board refuses to grant the requested temporary exemptions, the three say they will submit for cancellation their letters of registration as "irregular" air carriers.

▶**Regulations Hit**—The companies asserted that the present nonscheduled exemption, if construed to limit substantially the regularity of flights, appears to authorize an operation which is economically, financially and practically impossible. They said the current exemption "seems to contemplate the existence of air carriers which are authorized to operate between any points, but which cannot accept offered traffic if the demand for travel between any particular points becomes sufficient to enable the company to make a profit."

Granting of the exemption for scheduled "second class" service would divert little traffic from certificated lines, according to Standard, Viking and ATC. Existence of unsubsidized coach-type operators would, on the other hand, prod the certificated lines to greater efficiency and economy, the nonscheds contend.

▶**Poll Taken**—Standard said that on the basis of about 1000 questionnaires recently circulated among its passengers it is convinced that at least 85 percent would not have traveled by certificated airline if the coach-type plane service had not been available. "Substantially all of our customers are in low income brackets, and 85 percent reported they had never before flown in a commercial plane," Standard declared.

The irregular line noted that its one-way transcontinental fare of $99 plus tax compares with $143.15 plus tax for DC-3 and DC-4 coast-to-coast travel on certificated lines, and about $158 for the same run in the scheduled airlines' DC-6s or Constellations. And the second class air traveler finds other differences.

▶**Time One Difference**—Against 12-hr. coast-to-coast for express schedules on a certificated airline, the coach service averages around 20 hr. As scheduled carriers, Standard, ATC and Viking indicate they would continue to save money by omitting free meals in transit and economizing on reservations systems, baggage handling and downtown offices.

All three irregular operators claim they have operated profitably in the past despite "lack of subsidy," fares one-third lower than the certificated carriers, and the necessity for paying travel agents from 10 to 35 percent commission on traffic produced. In view of the previous assertion that profitable operations are impossible under existing nonschedule regulations, the certificated airlines may contend the irregular carriers have conceded they have been violating the Civil Aeronautics Act.

Standard told CAB it is operating with six DC-3s. Viking and Airline Transport Carriers said they were using nine DC-3s each. Between Feb. 10, 1947, and May 31, 1948, Standard flew 21,000,000 passenger miles in transcontinental operation.

Summer Profits

Airlines begin season upturn but overall loss for year still likely.

The domestic trunklines have entered the normally lush summer season with little prospect of recouping heavy deficits experienced during the first four months of 1948.

Only bright spot is the strong likelihood that this year's losses will be considerably under those of 1947. The 16 carriers finished 1947 more than $20,000,000 in the red.

▶**First Profit Shown**—While the industry edged into the black during May for the first time this year, the $869,636 operating profit was far below the $2,301,067 income reported in May, 1947. Last year the carriers had also shown a profit during April. But June results this year should be far better than in the same 1947 month, when traffic plummeted following three fatal DC-6 accidents.

The May profit reduced the domestic trunklines' aggregate operating deficit for the first five months of 1948 to $14,035,796. During the first five months of 1947, the operating loss was $16,036,262.

▶**May Results**—Eleven of the 16 domestic trunklines were in the black during May, 1948. Showing operating profits were: American $413,154; Braniff $32,036; Capital $132,596; Chicago & Southern $4248; Colonial $5696; Continental $45,355; Eastern $316,061; Inland $11,062; Mid-Continent $71,375; TWA $375,054 and United $74,446. Showing losses were Delta $115,207; National $216,746; Northeast $106,725; Northwest $97,021 and Western $75,748.

American's $413,154 operating profit in May, 1948, was considerably below the $772,635 reported in May, 1947. Eastern's $316,061 income in May compared with $691,160 last year, and United's $74,446 profit compared with $562,793 in 1947. On the other hand, TWA's $375,054 domestic profit exceeded the $225,124 earned in May, 1947.

▶**Traffic Picture**—Domestic trunkline passenger traffic in May of this year dropped about 5 percent under the same 1947 period, but the showing was still an improvement over April, when traffic was down 9 percent from last year's level. Moreover, there are indications that June was a fairly good month from both a trafficwise and a profit standpoint of view.

TWA has already reported that the number of domestic passengers handled and the amount of passenger revenue received during June established a new all-time high for any 30-day period. Passengers carried increased 27.5 percent over June 1947, and passenger revenue was up more than 12 percent.

▶**TWA Report**—Revenue passengers carried by TWA in the first six months of 1948 numbered 571,026, up 25.5 percent over the first half of last year. The $23,369,877 in passenger revenue for the first half of 1948 was 30.7 percent higher than the total reported in the same 1947 period. (Unaffected by the DC-6 grounding, TWA drew off considerable traffic from American and United during the first five months of 1948.)

United Air Lines also showed sharply improved business during June, with revenue passenger mileage up 21 percent over May and up more than 14 percent over June, 1947. Of four smaller carriers reporting June passenger traffic by early last week, two—Delta and Mid-Continent—showed gains, while Capital and Northeast had declines compared with the same month last year.

No Dull Journey

Australian National Airways has commissioned six observation coaches for use between terminal and airport to give ANA's passengers an opportunity for rubbernecking on otherwise dull journeys to and from the field.

Airlines Dispute Mail Rates

Carriers blame CAB for misconception of industry's position during an inflationary period.

United Airlines President W. A. Patterson has joined Northwest Airlines President Croil Hunter in publicly accusing the Civil Aeronautics Board of failure to carry out properly its duties under the Civil Aeronautics Act.

In his quarterly report to stockholders, Patterson severely criticized the Board's airmail rate-making policies. He added that CAB's staff has no conception of industry conditions or problems.

Earlier, Hunter had assailed "loose talk" about "so-called mail subsidies." He declared that health and strength of the nation's commercial airlines require fuller understanding by Congress and broader and more practical interpretation of the Civil Aeronautics Act.

▶**Effort to Save**—Patterson said: "The air transport industry has exerted every possible effort toward intelligent economy in order to maintain passenger fares at 1941 levels and carry U. S. mail at greatly lower than prewar rates. This is no longer possible, and the industry cannot be expected to accomplish something that other forms of transportation and businesses have been unable to do in the face of rising costs."

Hunter said: "Only a complete reappraisal of the airlines' importance and a sympathetic readjustment of the government's attitude can aid the carriers in assuming their own responsibilities and help them protect their state and that of their investors in maintaining world leadership."

▶**Blames Mail Rates**—Patterson inferentially blamed inadequate CAB mail rates for contributing to United's $3,157,243 operating loss and $3,239,852 net loss during the first half of 1948. Operating loss in the first six months of 1947 was $4,612,054, but income tax credits cut the net to $3,200,200.

United showed a $726,545 operating profit and $310,682 net earnings for the second quarter of 1948, compared with $509,091 operating profit and a $250,471 net in the same period of 1947.

Operating expense was up about 8½ percent in the first half of 1948 over the first six months of 1947, despite drops of 20 percent in general and administrative costs and 6½ percent in traffic, sales and advertising costs.

▶**Revenues Up**—Operating revenues in first-half 1948 were about 15 percent higher than the same period last year. Income from passengers, mail and freight gained substantially. Express income declined slightly.

During second-quarter 1948, revenue passenger miles were 399,011,011, against 325,190,689 a year ago. Mail ton miles dropped from 2,222,955 to 2,174,456, express ton miles rose from 1,697,960 to 1,764,864, and freight ton miles soared from 1,877,890 to 5,135,599.

▶**NWA Profit Possible**—Northwest's president foresaw that NWA at least will break even on a system-wide basis in 1948, but hinged his forecast on an assumption that higher passenger and cargo tariffs and mail rates would increase revenues.

For the first five months of this year, NWA had a $2,523,142 loss on domestic operations and a $234,192 profit on foreign service. May's overall operating loss was $22,093.

CAB's mail rate opinion of last April transformed the "big four" domestic airlines—American, Eastern, TWA and United—into the "big five" for mail pay purposes, adding Northwest.

▶**Similarities Cited**—The Board cited similarities of the five carriers and saw sharp contrast between their size and traffic potential and those of other domestic operators. Accordingly, it set up a uniform non-subsidy mail rate formula for the five lines. This will yield Northwest about 70.9 cents a ton mile, Eastern 68.38 cents, American 62.62 cents, TWA 61.45 cents and United 59.7 cents.

DEWEY-WARREN TEAM

Mid-Continent Airlines' best-known flight crew during the next few months probably will be Capt. William D. Warren (left) and H. B. Dewey (right). Back in January, when they were first paired together, MCA passengers speculated on their namesakes' chances of winning the Republican nomination at Philadelphia. On their first flight after the G.O.P. convention, Pilots Warren and Dewey received a mixture of congratulations and friendly gibes from their passengers.

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Mail Pay May Pull PAA, AOA out of Red

Prospects of sharply higher mail pay have enhanced the possibility that Pan American Airways and American Overseas Airlines will end up showing a profit on their trans-Atlantic services during the current year.

The increased revenue, aggregating about $6,600,000, is provided for in recent CAB show cause orders which set up temporary rates of 60 cents a plane mile for PAA and AOA retroactive to Jan. 1. A similar rate hike granted TWA in May enabled that carrier to surmount a financial crisis (AVIATION WEEK, May 31).

► **Breakdown Given** — Under its new rate, American Overseas will receive about $4,100,000 in mail pay during 1948, against $1,500,000 under the previous formula established last November. Pan American's payments will rise from about $2,600,000 to $6,600,000. TWA's annual increase was from an expected $3,000,000 to about $6,300,000.

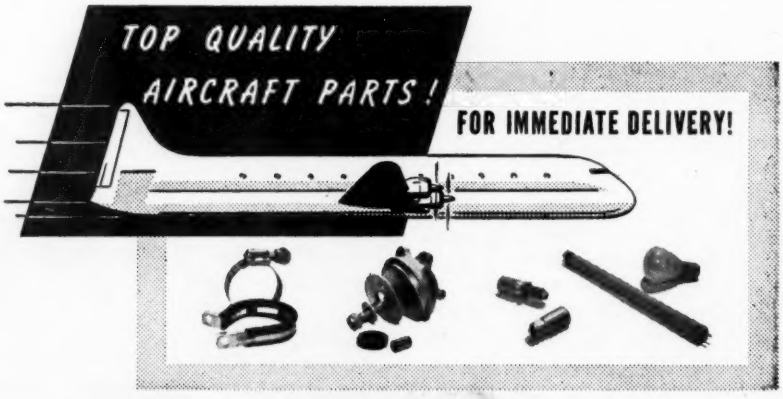
The former rates had been yielding AOA and PAA about 24 and 23 cents a plane mile, respectively. With the old scale, trans-Atlantic operations of both AOA and PAA were far in the red during the first four months of 1948.

► **Crisis Produced**—AOA had asked for a new mail rate of not less than 95 cents a plane mile for the period starting May 1, 1948, and not less than $4,000,000 in additional mail pay to cover losses incurred between July 1, 1947, and Apr. 30, 1948. These losses, AOA declared, had produced a financial crisis.

CAB replied that AOA's operations through September, 1947, were profitable under the former mail rates. It added that losses sustained by AOA during the final quarter fo last year should not be made good through increased mail pay since they were due to a pilot strike and seasonal traffic fluctuations and were not representative of results in a normal annual period.

Mid-Continent Wins

The Civil Aeronautics Board has reaffirmed its decision of Dec. 18, 1947, selecting Mid-Continent Airlines to operate between Kansas City, Mo. and St. Louis via Jefferson City. The Board last April had reopened the case for further argument to determine whether MCA or Continental Air Lines should have the route.



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More Fares Up

American and TWA plan to follow UAL with a fare rise due Sept. 1.

The move toward a third postwar passenger fare increase has gained momentum among the larger domestic airlines, but the carriers are also searching for ways to make the higher rates more acceptable to the traveling public.

Following United Air Lines' lead (AVIATION WEEK, July 26), American Airlines and TWA said they would increase basic fares 10 percent—to around 6.1 cents a plane mile—beginning Sept. 1. Previously, Northwest Airlines, the fourth transcontinental carrier, had indicated it would seek a fare hike this fall.

▶**Premium Rates Discontinued**—American's decision to institute higher basic fares was partially offset by its announcement that premium rates on its DC-6s would be discontinued. In the past, this premium has been approximately a half cent a mile above the basic 5½-cent level. C. R. Smith, AA board chairman, explained that with introduction of 300-mph. Convair-Liners on short hauls, the company felt fares should be standardized on all types of equipment.

Besides equalizing passenger rates at slightly above six cents a mile after Sept. 1, American said it would file with CAB a "first of the week family fare plan" permitting wives and children (21 years old or less) to travel at half fare. The plan will be effective only on Mondays, Tuesdays and Wednesdays of each week, the days when the airline traffic level is considerably below average.

▶**Plan Explained**—Under the unique program, a husband purchasing a full fare New York-Los Angeles ticket for first of the week travel could take his wife and children with him for $78.73 each, compared to the regular fare after Sept. 1 of $157.45 plus tax. If either parent alone purchases a full fare ticket, he or she may take the children at half fare. Present regulations providing half fare rates at all times for children between two and twelve and no charge for children under two are not affected by the new plan.

American Airlines officials predicted the increase in basic passenger fares and the added appeal to family budgets will produce substantially higher revenue. About 35 percent of AA's travel volume will be affected by the half-cent rise in basic fares since about 65 percent of the traffic is in DC-6s, on which rates will be unchanged.

Neither United Air Lines nor TWA had by early last week made provision for elimination of premium fares on their DC-6s and Constellations when the Sept. 1 basic rate increase takes effect. Thus, while basic rates would move up from about 5½ to 6.1 cents a mile, premium fares would advance to around 6.7 cents a mile. There is considerable speculation that United and TWA may follow American in abandoning premium fares in view of the basic rate hike.

Air Cargo Research

Experimental work in development of air shipment of California's agricultural and manufactured products is being undertaken by the Air Cargo Institute of California, a non-profit corporation. The Institute is an outgrowth of the Air Cargo Project Committee of the California Aeronautics Commission.

Harold Angier, general manager of the California Grape and Tree Fruit Association, was elected president of the new organization by the 27-member board of directors. J. Prescott Blount was selected as full-time managing director. Main offices are in San Francisco.

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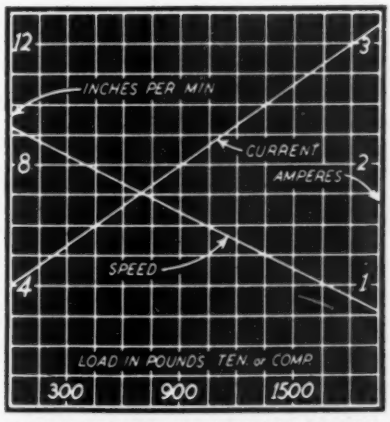

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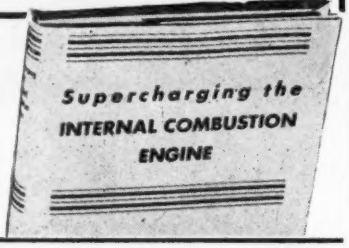

JET PROPULSION PROGRESS

The Development of Aircraft Gas Turbines By L. E. NEVILLE, Director, Standard Aeronautical Index, Inst. of the Aero Sciences, and N. F. SILSBEE, Colonel, Air Reserve. 227 pp., 97 illus., $3.50.

This book covers every aspect of aircraft gas turbine design in non-technical terms—gives you a detailed analysis of such vital points as **gas turbine theory . . . heat resistant alloys . . . special jet fuels . . .** and **maintenance of jet engines.** It tells the absorbing story of the earliest trial-and-error experiments—outlines the design and construction problems that were overcome—describes the recent rapid developments that have made the piston engine obsolete within the space of a few years.

THEORY OF PROPELLERS

By THEODORE THEODORSEN, Vice-president, the Institute of Technical Aeronautics. 164 pp., 62 illus., $3.50.

Here is a compact analysis of modern aerodynamic theory of the propeller, based on, and including, the results of intensive research conducted under the auspices of the National Advisory Committee for Aeronautics. It shows how to measure directly the potential function for optimum load distribution on propellers . . . brings you detailed treatment of the Goldstein distribution functions . . . new functions for dual propellers . . . and practical formulas for ideal propeller efficiency.

SUPERCHARGING THE INTERNAL COMBUSTION ENGINE

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SHORTLINES

► **Air France**—Has inaugurated twice-weekly service from Paris to Barcelona, Spain. Flights make direct connections at Paris with the carrier's trans-Atlantic service.

► **Chicago & Southern**—CAB has placed in effect the higher airmail rates proposed for the company's domestic routes last month (AVIATION WEEK, July 19).

► **Mid-Continent**—Reports net profit of $25,496 in June. Net profit in the second quarter was $72,602 compared to a $104,914 net loss in the first quarter. This brought the net loss for the first six months of 1948 to $32,312 against a $5302 net profit for the same period last year. Both operating revenues and expenses in June were 21 percent higher than in June, 1947. Revenue passenger miles rose 13 percent over the same month last year.

► **Pan American**—Following a TWA complaint, CAB has instituted an investigation to determine whether PAA is violating the Civil Aeronautics Act by operating between the U. S. and Saudi Arabia without a certificate. . . . Overall PAA passenger traffic in second-quarter 1948 was 13.6 percent above the previous quarter.

► **Philippine Air Lines**—Passenger traffic from the U. S. to the Orient during June increased 168 percent over May.

► **Pioneer**—Is installing ILS equipment in all its planes.

► **TWA**—Has received the last of its twelve new sleeper-type Constellations for use on overseas routes. . . . Savings of $103,000 resulted from employe suggestions during the first four months of 1948. . . . Company carried 32,047 passengers on its overseas routes during the first half of 1948 against 26,288 in the same period last year.

► **United**—Will inaugurate service to Bradford, Pa., around Sept. 1. . . . Company flew 1,751,500 freight ton miles in June, up 209 percent over June, 1947, but down 3 percent from May, 1948. Express totaled 607,760 ton miles in June, 1948, up 21 percent over June, 1947, and 8 percent above May of this year.

► **Wien Alaska**—CAB has set the company's temporary mail rate on and after Apr. 1, 1948, at $1.10 a plane mile.

► **Wisconsin Central**—Expects to show a $25,000 profit in August, six months after inauguration of its feeder service. . . . Company now operates six Lockheed Electras and employs 30 pilots. . . . Service was inaugurated to Land O' Lakes, Wis., late last month.

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CAB SCHEDULE

Aug. 9—Prehearing conference on need for directional airfreight rates. (Docket 1705, et al.)

Aug. 10—Prehearing conference on CAB's investigation of IATA agreements. (Docket 3350.)

Aug. 11—Hearing on National Airlines route consolidation case. (Docket 2967.)

Aug. 12—Oral argument on complaints by the Air Line Pilots Association and International Association of Machinists against National Airlines, postponed from July 29. (Dockets 3283 and 3298.)

Aug. 16—Prehearing conference on CAB's investigation of Hughes Tool Co.'s acquisition of further control of TWA. (Docket 2796.)

Aug. 30—Hearing in Capital Airlines mail rate case. (Docket 484.)

Sept. 2—Oral argument in TACA, S.A., foreign air carrier permit renewal and amendment case. (Docket 3016.)

Sept. 13—Hearing on CAB's investigation of free and reduced rate transportation. (Docket 2737, et al.)

Sept. 19—Hearing on amendment of China National Aviation Corp.'s foreign air carrier permit. (Docket 3402.)

Oct. 4—Hearing on route consolidation applications of American, Eastern and TWA. (Docket 2581, et al.)

Oct. 11—Hearing in U. S.-Alaska service case. (Docket 3286, et al.)

Dec. 1—Hearing on additional service to Puerto Rico. (Docket 2123, et al.)

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International News—14; A. U. Schmidt—21, 22; Wide World—13.

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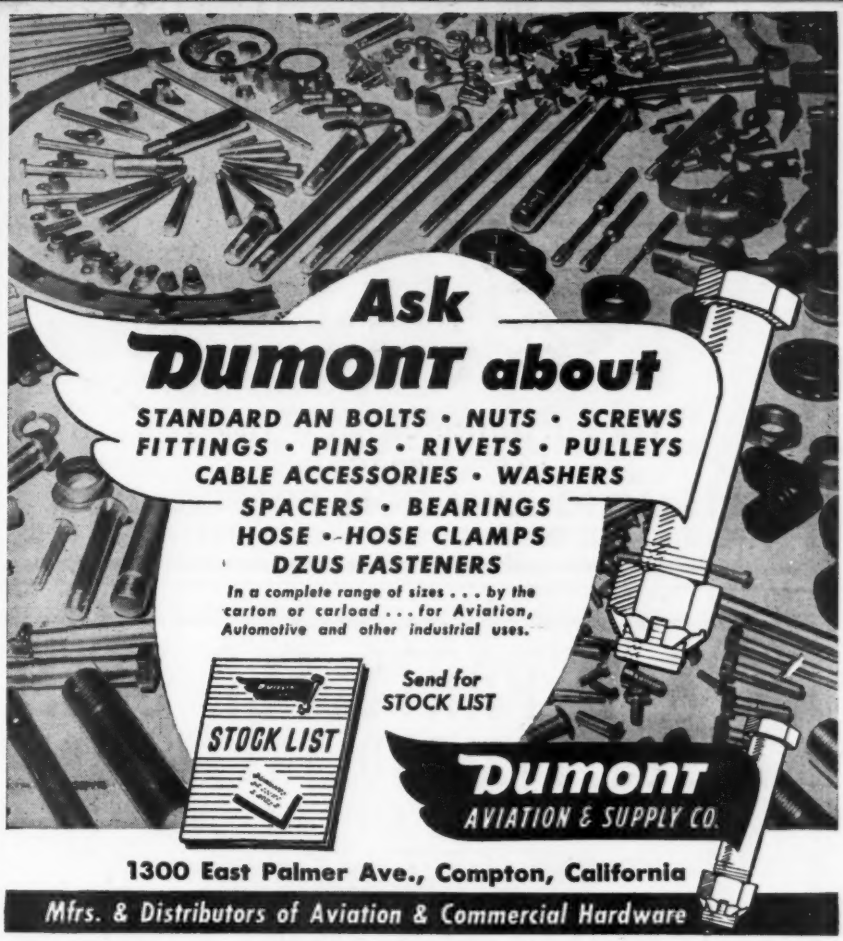

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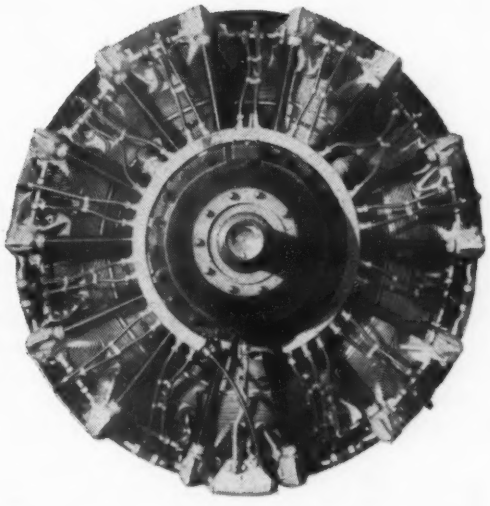

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ADVERTISERS IN THIS ISSUE

AVIATION WEEK—AUGUST 9, 1948

Airborne Accessories Corp. 43
Agency—Weber-Thomson Associates

Air-Maze Corp. 26
Agency—Batten, Barton, Durstine & Osborn, Inc.

Albertson & Co., Inc. 34
Agency—E. W. Sann & Associates

Ambrose Aviation Co., Frank 43
Agency—Steedle, Rankin & Boyle, Inc.

Ansul Chemical Co. 30
Agency—J. A. Cormack Adv.

Beech Aircraft Corp. ..... Fourth Cover
Agency—Erwin, Wasey & Co., Inc.

B. G. Corporation, The ..... Front Cover
Agency—Albert Frank Guenther Law, Inc.

Chicago Pneumatic Tool Co. 8
Agency—G. M. Basford Co.

Dumont Aviation & Supply Co. 45
Agency—Jordan & Lo Buono Adv.

Edison, Inc., Thomas A. 31
Agency—The Schuyler-Hopper Co.

Esso Standard Oil Co. 19
Agency—McCann-Erickson, Inc.

General Controls Co. 24
Agency—The McCarty Co.

General Electric Co. 20
Agency—G. M. Basford Co.

Gladden Products Corp. 31
Agency—Davison-Dibble Co.

Goodrich Co., The B. F. 3
Agency—Batten, Barton, Durstine & Osborn, Inc.

Kilgore Mfg. Co. 25
Agency—Byer & Bowman, Inc.

Kohler Co. 9
Agency—Roche, Williams & Cleary, Inc.

Lavelle Aircraft Corp. 31
Agency—Broomfield-Podmore Adv.

Lockheed Aircraft Corp. 28, 29
Agency—Foote, Cone & Belding Adv.

Luscombe Airplane Corp. 41
Agency—Tracy Locke Co., Inc.

McGraw-Hill Book Co. 44

Macmillan Co., The 42
Agency—Atherton & Currier, Inc.

Moulton Co., Inc., The 42
Agency—Jaycraft Co.

Ohio Seamless Tube Co., The ..... Second Cover
Agency—Howard Swink Adv. Agency

Phillips Petroleum Co. 5
Agency—Lambert & Feasley, Inc.

Radio Corporation of America 6
Agency—J. Walter Thompson Co.

Scintilla Magneto Div. of Bendix Aviation Corp. 27
Agency—MacManus, John & Adams, Inc.

Searchlight Section 45, 46, 47

Senior, Jr., John L. 44

Sensenich Corporation 48
Agency—Foltz-Wessinger, Inc.

Sherwin-Williams Co., The 23
Agency—Newell-Emmett Co.

Southwest Airmotive Co. 45
Agency—Wilhelm, Laughlin, Wilson & Associates

Sperry Gyroscope Co. ..... Third Cover
Agency—Charles Dallas Reach Co., Inc.

Surface Combustion Corp. 10
Agency—Bramble & Odiorne Adv.

Titeflex, Inc. 4
Agency—Sykes Advertising, Inc.

Wilson Co., H. A., The 49
Agency—Charles Dallas Reach Co., Inc.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT
Positions Vacant 45
Selling Opportunities Offered 45
Positions Wanted 45

EDUCATIONAL
Schools 46

PLANES—EQUIPMENT
(Used or Surplus New)
For Sale 46

WANTED
Equipment 46

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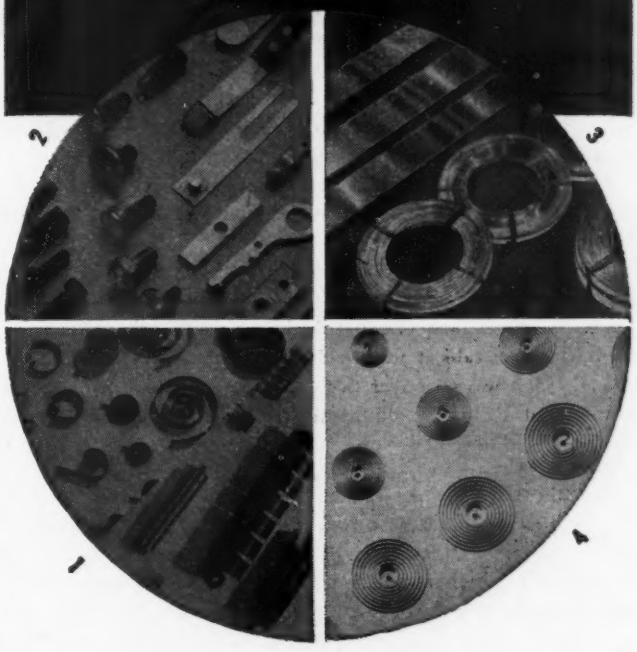

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EDITORIAL

An Industry Loses its Vision

The bitter struggle for breath by uncertificated cargo airlines is eclipsed this week by similarly desperate efforts of three transcontinental, uncertificated passenger companies.

All three hold CAB letters of registration as irregular carriers, but CAB will probably hold that they have been offering regular service instead.

When the Civil Aeronautics Act was written in 1938, no one dreamed that irregular or nonscheduled passenger or cargo traffic flown by others than certificated airlines would ever amount to anything. The subject was woefully neglected in the Act.

In 1938 it was conceded that air cargo held tremendous possibilities, but that it would be the certificated lines who would build that business. The same was held for special passenger charter service.

But the war spawned thousands of transport planes. Surplus hundreds were sold after VJ-Day. Scores of wildcat nonscheduled freight operators set up shop. The majority lost their shirts and disappeared. But a few able newcomers hung on, and concentrated on a sales promotion campaign that thoroughly outdid the certificated lines, whose main interest was in rebuilding their passenger business. A few passenger charter companies lingered and gained new business with every fare increase by the big lines.

Now, CAB is handicapped by a law that is inadequate, and is bogged down in red tape trying to define its own makeshift, ambiguous terms and cook up prohibitions that will hold water. It, like the big certificated airlines, fails to see the woods for the trees. It is worrying more about vested interests than public service, because its own sins of omission and commission over ten years of inconsistencies have caught up with it.

Members of the present Board deserve sympathy and good wishes for some extrication from their predicament.

One obvious answer to CAB's problems, of course, is an amended Civil Aeronautics Act. Because the act which was created to foster and nurture one promising, tender industry is now being used to throttle another one. Now, in 1948, this act is perpetuating something very close to a monopoly which month by month demands more and more public succor, and demands death to those who threaten to show lower costs.

For the transcontinental certificated lines say that Uncle Sam pays them to operate, anyhow, and any unused space is a loss to the taxpayer. So that when a government agency allows an uncertificated carrier to "divert" passengers from a mail carrier's aircraft, the government is costing itself more money.

But this argument implies that non-scheduled carriers are diverting many passengers from the subsidized companies. This contention insults the intelligence of too many persons to carry much weight. Because it is contrary to transportation economics, and history. It implies that those who paid $99 for a 20-hour coast-to-coast flight, without free meals or other refinements, were customers lost to a certificated airline charging $165 for DC-3s or DC-4s, or $180 for extra-fare ships, with free meals, and luxury service, and 12 hour flight or less.

The airlines thus argue that every railroad coach passenger is a passenger lost to the Pullmans. No railroad economist will agree, and he is even willing to let the coach passenger arrive at the same time as the parlor car rider in order to get the business. There is probably not a single irregular transcontinental air carrier that crosses the country as quickly as a certificated company.

Instead, we have the industry going always to the public till for higher mail rates while raising fares notch by notch, carrying fewer passengers after each fare hike, preparing new cases for more Post Office money, and seeking to shut out the field to those who are proving that the public will fly and ship cargo by air under the same conditions it will patronize any other business from pickles to breakfast food. Why is the scheduled air transportation business any different?

How does the great traveling public get any added service for its tax money with ever-rising mail rates and ever rising fares?

So, we have a law that must be amended. Until it is modernized, CAB cannot make the best decisions in the public interest. It cannot encourage violation of the law. It cannot, on the other hand, be so blind as to ignore the fact that air transportation is accessible to less and less of the public with every fare increase. It will have to make compromises and interpretations of the act and it cannot permanently shut out every low cost passenger and cargo carrier. The Act has by its generous guarantee of mail pay encouraged inefficiency and extravagance.

We are beginning to see a growing monstrosity completely at odds with the American system of competition which gives the people the most for their money. The air transport industry has grown up; the days of nurturing it by law should be over.

Like the CAB, the industry can help itself now. It is not getting down to brass tacks. It blames everyone but itself for its predicament of bankruptcy and dependence on the government. Instead of fighting a war against competition with strange accusations, and expensive legal battles, it should be looking at the hand writing on the wall.

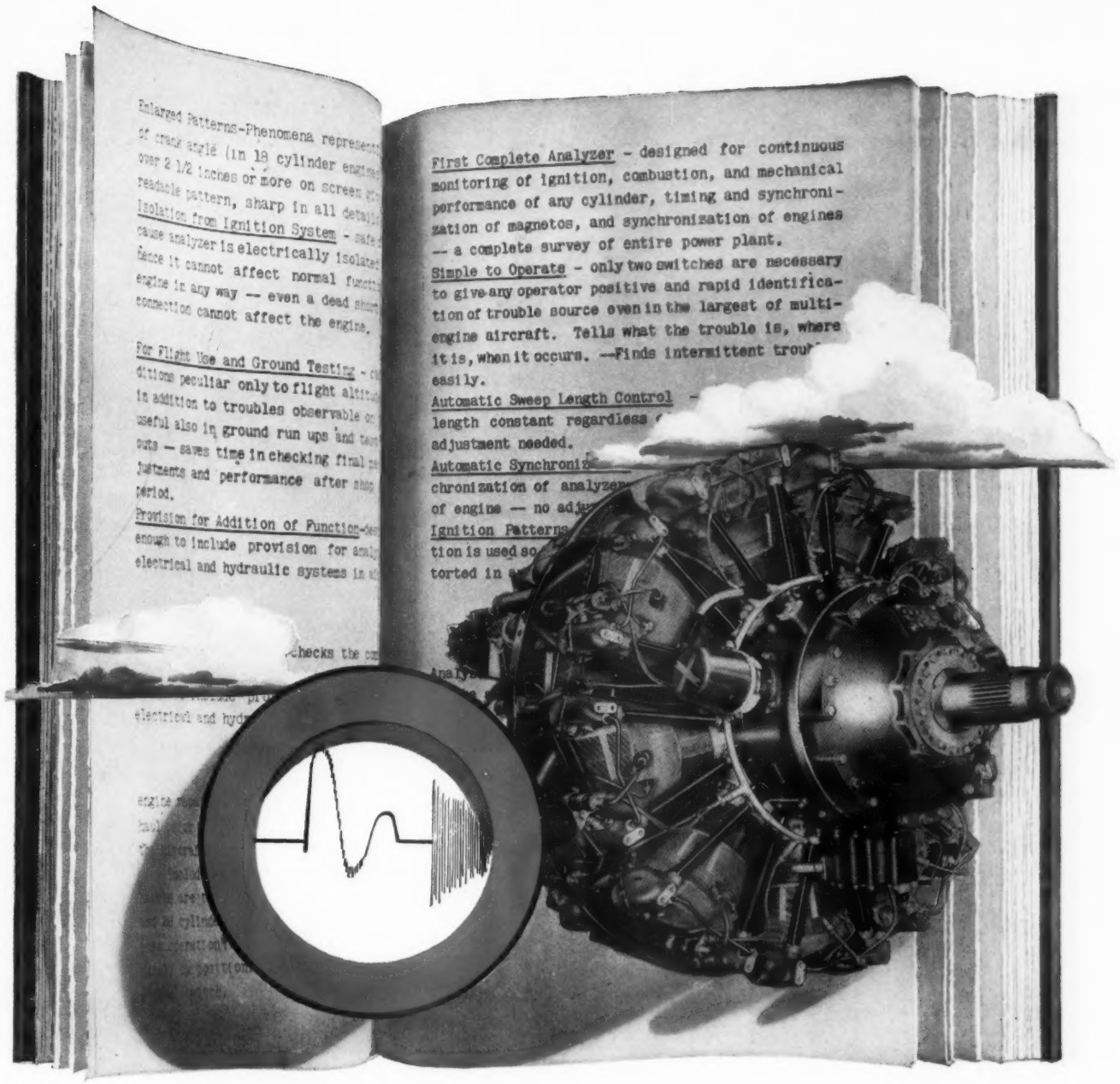
It should be cleaning house, trimming budgets, learning transportation economics so it will understand why there are so many $99 coast-to-coast passengers who are willing to use daycoach service the big airlines won't give them.

For the hand writing is clear. An ominous explosion is certain.

Every mail rate increase, every fare increase, brings the day closer. Every small air carrier that is ordered out of existence after a safe and economically sound record of public service brings the day closer. The public will not, indeed, encourage law breaking, but it certainly will demand a change in the law. The Post Office Dept. already worries about spiraling mail rates. The daily and magazine press is showing signs of inquiring into the picture, and will as surely as tomorrow's sunrise, despite all of the legal talent the industry can garner.

CAB must heed these warnings and interpret the act as freely as it can, without encouraging law breaking. The industry can pull its belt tighter and forget some of its de luxe visions of grandeur. Only in these ways can we postpone the inevitable, an era of air competition the like of which we have never seen.

ROBERT H. WOOD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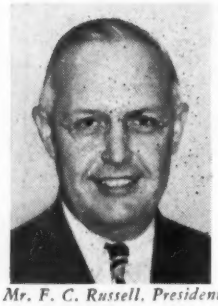

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